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SURGICAL OBSERVATIONS;

BEING A

Quarterly Report

OF

CASES IN SURGERY;

TREATED

IN THE MIDDLESEX HOSPITAL,

IN THE CANCER ESTABLISHMENT,

AND

IN PRIVATE PRACTICE.

EMBRACING

AN ACCOUNT OF THE ANATOMICAL AND PATHOLOGICAL RESEARCHES

IN THE

SCHOOL OF WINDMILL STREET.

BY

CHARLES BELL.

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Preface.

THE object of this Work is to illustrate the Principles of Surgery by Observations made in a Public Hospital and in a School of Anatomy, where every thing is open to inspection, and where, consequently, the statements are made in the presence of many observers.

The Author does not intend to publish more than Three Volumes of Cases. These he hopes will embrace the whole Practice of Surgery, and supply a Book of Reference for the History of Surgical Diseases, and the minute Account of Symptoms.

This work was suggested by observing, that published Cases contain only what is new and monstrous, and but few examples which may serve to initiate the young Surgeon into the business of his profession. But although the Author began to take his Cases with the intention of illustrating the common matters of practice, he now hopes that they may sometimes have the interest of novelty also; since the close observation of what are called common Cases has led to new views and improvements of practice, as well as to the illustrations of the acknowledged principles of the art. Every one must be convinced that there is room for a Critical

Inquiry into the present state of Surgery, and it cannot be more safely undertaken than in the form of Observations made at the bed-side of the patients.

In published cases, a very common defect is too much consistency—matters proceed so smoothly, that when the young Surgeon enters on the actual duties of his profession, he is troubled with adverse occurrences, for which he is quite unprepared: and he wonders to find his experience so different from what he has been led to expect from the perusal of Cases. The utility of Cases arises from the confessions of the Surgeon which exercise the reader's mind, and enable him to anticipate the harassing difficulties of practice. Whoever proposes to publish useful Cases, must have a full dependence on the candour and liberality of his readers, and forget those who lie in wait for occasions of rancorous criticism. He has to draw two parallel histories—the history of symptoms, and the history of his own mind, with his doubts and anxieties during the course of the disease. Just so far as the observer's mind is active, and the communication of his thoughts free, will the Cases be useful.

The Author wishes to avoid that distortion which love of system produces in Cases which are given in illustration of particular doctrines. He hopes to combine the interest and usefulness which arise from the perusal of Cases, classed so as to enforce practical results, with the genuine and un-

coloured statement which belongs to the records of an hospital. With this view the details are noted in their progress, in the form of a journal, but the practical lessons are given in accompanying remarks; being selections from the Clinical Lectures delivered to the Students of the Middlesex Hospital—remarks made to those who have witnessed or assisted in recording the facts on which those lectures form a commentary.

Cases naturally connected are thrown together under the head of *Report;* but the subject of these Reports will be brought forward repeatedly in the course of the work, and it is to be hoped, therefore, that they will not be judged of as complete dissertations.

In a work which is to be published in parts, it is necessary to make this statement of the Author's views; and these explained, and the extent of his opportunities being known to be at least as great as the most industrious man can use to advantage, the Author dares venture no further in stating what is to be contained in these volumes. Those who feel interested to inquire, may find security for the fulfilment of this undertaking in a life hitherto given up to the improvement of the younger members of the profession—where the labour and the pastime have been only a variation in the manner, not in the object of pursuit,—namely, the improvement of Anatomy, and its application. The Author now enters on subjects of higher interest, and greater magnitude, as relating to questions of life

and death. In judging of his motive it will perhaps be recollected, that upwards of twenty years have been given to Anatomy, and to the teaching of the acknowledged Principles of Surgery, without aiming at improvements in practice; that before he has entered critically on matters of practice, he has waited until half a life, spent in the laborious duties of teaching, together with the possession of the fullest opportunities, may be supposed to have matured his judgment.

He is happy in thinking, that by this undertaking, he shall prolong the term of his connexion with his pupils, and continue to afford to them, though in the country or on service, the advantages of Hospital Practice and an extended experience, which at a distance from the capital are not easily obtained.

London, Soho-Square,
September 2, 1816.

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FIRST REPORT.

ON CANCER.

A Report on Cancer is offered in the Commencement of this work as a pledge for the fulfilment of one of the objects which I had in view in undertaking it, which was to give the history of this disease and of those which most resemble it. It is a field hitherto so little cultivated, or so barren of improvement, that it requires a pledge to prevent the relinquishment of so painful a subject. But were there no hope of improving our practice in this disease, it is still a duty, especially incumbent on a Surgeon of the Middlesex Hospital, to turn others from the errors which he may himself have committed, and to shew, by his experience, what is injurious or unprofitable.

For a long time the patients in the Cancer Establishment of the Middlesex Hospital were taught to return thanks to an unknown benefactor. The late John Howard brought a sum of money to the hospital from one who desired the benefaction to be concealed. This money was given for the purpose of supporting a certain number of women, victims of cancerous disease, and for affording an opportunity of investigation.

On the death of the late Mr. Whitbread's father, it was ascertained that he was the benevolent founder of this institution. The late Mr. Whitbread himself took a great interest in the establishment, and in every attempt to discover a cure for cancer.

I witnessed his unwearied attention to this subject, as he consulted me on some of the many schemes which were offered to him; and I am indebted for the great exertions which he made on the occasion of my election to the Middlesex Hospital, to his belief that I would endeavour to make this institution useful to the utmost of my power.

The humane attention of the governors who constitute the board of the Middlesex Hospital, to the objects of the charity, is well known; and on this particular subject of cancer they have shewn great zeal and liberality. Many proposals are annually received by them for the cure of cancer, and always with that consideration which the motives of those who offer them deserve. But while our governors have shewn themselves most

desirous of promoting inquiry on the subject of cancer, they have remained uncontaminated by that love of quackery which is so common among the gentry of England, and have referred these proposals to their medical officers.

Of the subjects brought into notice during the last year, two have principally engaged attention: the treatment of cancer by regimen, and what is said to be a successful mode of curing cancer, by compression.

The recommendation of the plan of compression by Mr. Whitbread, called the attention of the surgeons of the hospital to the subject. The following report gives the result of their practice. I have only to observe, that the essential part of this new plan of cure is the compression of the cancerous tumor, gently at first, and with a force gradually increased, till at last it is augmented to a very great degree: and that the means are these—if the cancer be open, the various holes and cavities are filled up from the bottom with chalk, finely levigated, and all the surface is thickly covered with hair powder; over this, long plaster straps are put, so as to cover the whole surface of the tumor, over this again are placed linen compresses, bound down with the turns of a roller, firmly applied, and of six yards in length; or over the first straps are laid a second set, bracing the parts more firmly than the first, over this a plate of lead, and lastly, the long roller is carried round the chest, compressing the whole.

REPORT

OF THE

Medical Committee of the Middlesex Hospital,

OF THE

22D JUNE, 1816,

ON THE

RESULT OF THEIR EXPERIENCE IN CASES OF CANCER TREATED BY COMPRESSION.

THE Medical Committee having met, pursuant to the resolution of the Board, to take into consideration the result of their experience in the cases of cancer, treated by compression, report as follows:—

That eight cases of open cancer [as it is commonly called] and eight cases also of the scirrhous kind, have been submitted to the treatment by compression; some of them for several months, and others for a shorter period.

That in some of the cases of open cancer, combined with considerable œdema, the pressure was useful in lessening the volume of the tumor: but that it had not, even in a single instance, any salutary influence upon the specific nature of the disease. It frequently gave so much pain that the patients could not, after repeated trials, endure

it, under any modification whatever; and often it appeared to hasten the fatal event.

That in the scirrhous tumors, the disease advanced, rendering extirpation necessary in two instances: in six others the disease passed into ulceration, assuming the usual malignant appearances, and terminating in death. Two cases still remain under the care of the respective medical officers.

Your Committee have therefore to lament, that compression cannot be regarded as a remedy for cancer.

Your Committe, however, although they can not lay claim to the discovery of a specific, have still the consolation to believe that they have in many cases succeeded in obtaining great alleviation of suffering; such alleviation as might, perhaps, induce some speculative minds, less disciplined by experience, to conclude, that they had at length succeeded in discovering a cure for cancer.

Your Committee can only express their determination to continue the attention which they have always given to the object of your establishment.

ADDITIONAL OBSERVATIONS,

ON THE SUBJECT OF THE FOREGOING REPORT, DELIVERED TO THE STUDENTS OF THE HOSPITAL.

In the end of a season, when most of you are going into the country, you ought to be made acquainted with the effects of compression on Cancer, as exhibited in the practice of this hospital. And having heard the above report of our experience, I would now have you to examine the subject further, by reasoning and the comparison of what is proposed, with the principles of surgery, which it has been your business to learn.

And in the first place, permit me to say, that the question is not whether pressure be of service in cancer? but whether or not a very great degree of pressure is equal to the destruction and eradication of cancer?

It is known to every pupil within the walls of this hospital, that regulated pressure is one of the most powerful means that can be used for the alleviation or cure of a great many local diseases: and in this lies the source of error. Pressure is sometimes attended with visible advantages even in cancer, which has given rise to unreasonable expectation, and as these must be disappointed, what has taken place in other instances is in danger of happening here, where a remedy extravagantly extolled, is, on the appearance of failure,

altogether discarded. Let me therefore remind you,

1. *That rest and support are necessary to the cure of surgical diseases.*

Of this the venereal ward at this time furnishes you with two pertinent examples. Mercury is the specific for venereal ulcers; yet without compression and rest the sores in the groin, and the fistulous sores on the side of the chest and around the clavicle, in the case of Basset, would have propagated themselves, or remained a source of irritation upon the constitution. You have seen that simple dressing with the compress, like a ball placed in the groin, and the spica bandage, has very quickly amended the aspect of the buboes: and the sores upon the breast, though of long standing, have healed under pressure, and the binding down of the arm, so as to restrain its motion.

And here let me remind you of an observation, too little attended to, that when the mamma is fretted with an open ulcer, or when there is much disease of skin with sinuses, or disease in the axilla, it is necessary to bind both the chest and the arm. Some of you must remember the example that I have offered to your notice on another occasion. A gentleman had sores with sinuses on his chest, which resisted every means of cure, until the attendants concluded that they were habitual to the constitution, and irremedi-

able: at length, by a lucky accident, he broke his arm, and under the necessary bandaging and confinement of motion, his sinus quickly filled up.

Do not therefore be satisfied with pressure, though it be extolled as a sovereign remedy for ulcers: but give rest. Remember how the same ulcer differs on the ancle joint and on the leg: how an ulcer on the lip, or on the tongue, will, by the same cause, (namely, incessant motion) be irritated into the appearance of a malignant disease: how an inflammation or abscess about a joint or in the tract of muscles, will be aggravated by motion. Further, your lessons of anatomy teach you, that in order to give rest to a suppuration on the side of the head, the jaw must be kept still: if in the loins, the thigh must be kept still: if on the breast or back, the arm must be kept still.

In applying a bandage to an ulcer or sinus, two things are to be attended to, that the diseased parts be *supported*, and that they have *rest*. So far as the practice we are examining effects those two purposes, it is beneficial: when carried further, it is injurious. That it is carried by much too far, I have no hesitation in affirming.

In the work which has been recommended by the letter of Mr. Whitbread, the case in which the cure is most satisfactory (indeed, if I recollect, the only instance of cure) is of a cancerous lip. It is easy to prove that.

2. *They are anticipated in the method of curing what is called cancer of the lip.*

A short statement of the progress of my opinion on this subject, will be the best illustration of the principle. I had seen the excision of a part of a cancerous lip, [or rather, such as was supposed to be cancerous], where a part of the ulcer was necessarily left, it being impracticable to cut away the whole diseased portion; notwithstanding this, the operation succeeded; that is to say, the wound united, and the remaining ulcer healed. Reflecting on this occurrence, two things seemed evident —1. That the disease which appeared so malignant in its aspect, was in reality not cancer, but an ulcer, aggravated by the motion of the lip—2. It was made manifest that the pinning and strapping of the lip after the operation, to keep it still, and procure adhesion, had the further effect of removing the cause of irritation, and healing the remaining ulcer.

The practice obviously deducible from this reasoning was, that if by the straps, or what are called the dry suture, we could keep the lip perfectly still, and prevent it from moving in the act of speaking, laughing, swallowing, &c. we should infallibly cure malignant ulcers of the lip without excision. This I put in practice with success, twelve years ago, and have since uniformly recommended it.

3. *Specific action is not subdued by pressure,*

and therefore this method can not be a cure for cancer.

According to my experience, pressure does not subdue specific action. It will diminish the size of tumors: it will produce a wasting even of natural parts; but that specific action which is the essential character of cancer, and that which is the cause, or which precedes the morbid accretion and growth, will continue under pressure while there is life in the part. This we might expect from the revival of the cancerous action, in circumstances nearly resembling the means now proposed to destroy it. When it has been supposed that all the tumor of the cancerous mamma has been extirpated, the cut surfaces brought into contact, strapped and covered with lead to keep them smooth, with compress and bandage over all —at the time the natural action of healing prevails, and when the parts are kept at rest and compressed, the edges of the incision become tuberculated, and the cancerous action is propagated, and recommences its ravages in the cicatrix.

This is a fact familiar to the experience of most surgeons in their early practice, and was one reason among many, why I never could allow myself to hope for success from this *new mode* of compression. In point of fact, in no one instance has compression retarded the progress of the disease, nor subdued, even for a time, the specific action of cancer.

4. *Nor is it desirable that the absorption of the matter of cancer should take place.*

In true cancer there is a peculiar matter unlike the original structure of the body, produced by the specific action, and deposited in the texture of the tumor. Now, were it proved, that the compress and bandage did actually excite the lymphatics, to absorb the cancerous deposition, and carry it into the circulation, it does not appear to be a thing desirable. As this, however, is merely matter of opinion and speculation, I shall not dwell upon it further than to say, that in the cases in which the effect of pressure was manifested by the diminution of the tumor of the breast, it certainly did not retard the course of the disease, nor change the nature, nor diminish the severity of the last fatal symptoms.

5. *Pressure accelerates the coming on of the last fatal symptoms in scirrhus of the breast.*

Women labouring under cancerous mamma die of an affection of the chest, generally with great collections of serum in the cavities of the chest. In the case of Davidson, there was a circumstance which marks very strongly the oppression which those patients have to suffer: more than a gallon of fluid was in the cavities of the chest, which had so impeded the course of the blood from the right to the left side of the heart, that the blood had oozed from a small chink in the cava, and distended the pericardium.

It cannot therefore have been surprising to you, that this woman and many others, on whom the bandage has been firmly applied, have thrown their trappings off as an insufferable load.

6. *Pressure brings the diseased mamma earlier into contact with the muscles and ribs, and thereby accelerates the fatal affection of the chest.*

By a great degree of pressure upon the large scirrhous mamma, a very rapid change is produced upon the bulk of the tumor. But the absorption is principally of the interstitial fluids and surrounding fat, and a condensation of the cellular membrane takes place. By this wasting and compression of the subjacent cellular substance and fat, the mass of disease is brought nearer to the muscles and ribs, and adhesion of the tumor to the ribs is the consequence. It has been stated that compression loosens the tumor, but in one instance the application of the straps and bandage had the effect of fixing the tumor of the breast in the proportion of its diminution. Certainly in that case the disease is now incorporated with the ribs, and effusion into the cavity of the chest must soon take place.

The late Dr. Denman greatly improved his department of practice, and was justly esteemed in the first rank for independence and knowledge, as well as beloved for his many virtues. He fell into the belief that pressure would prove a remedy for cancer, and lent the influence of his name to re-

commend this practice. He, in a particular manner, expressed a hope that it would prove a means of suppressing the fungus hæmatodes. But you have seen two cases of that disease in which pressure aggravated the pain, and had no power in subduing the tumor.

7. The idea is not new.

And now it only remains for me to state, that the idea of destroying by pressure, dangerous tumors, which could not be extirpated with the knife, is familiar to me from my first entering upon the study of our profession. Mr. John Bell had an opinion, that it was possible to suffocate and subdue the action of vessels in tumors by the compress and bandage. This he was wont to illustrate by the effect of that bandaging of the limbs, by which mendicants reduce the substance of their limbs to a third part of their natural bulk; by the example of the feet of the women of China, and other ingenious analogies. He argued, that if the natural structure of the body could be moulded by pressure, why should not these formidable tumors ?

When tumors have been of the nature of aneurism or varicose enlargement of vessels, I have seen advantage from the application of the roller and cold solution, but I have never seen any occurrence now or formerly, to encourage the hope of curing cancer by pressure.

SECOND REPORT.

CASES

OF

Diseases and Wounds of the Larynx,

AND OF THE

OPERATION OF LARYNGOTOMY.

This subject is introduced on the very first occasion, from a conviction of its importance, and from the persuasion that it has not met with the attention it deserves.

Very early in life I witnessed the death of a student, from suffocation. He had dined abroad, and being a careless, dissipated young man, he had reeled home through the streets in a severe winter night. The following day he was attacked with shivering and fever, and sore throat, and died, in three days, from suffocation. On dissection, no obstruction in the larynx was to be observed, but only an inflammation of the membrane of the larynx, and a spot like a small pox* pus-

* Without meaning to say that this was a small-pox pustule, yet it proves a fortiori, that the small-pox pustule forming in the

tule upon the margin of the glottis. Sudden death, from a cause seemingly so trifling, made a strong impression upon me, and from that time I have omitted no opportunity of searching into the diseases of the trachea. On this, and on many other occasions, it will be necessary to refer to the preparations in my collection, both as authorities on which to ground my reasoning, and in order to keep the reader's attention to the facts of morbid anatomy. We shall commence our observations on the most secure grounds, having before us the catalogue of what is most useful to be known of the appearances on dissections*.

XI. 1. M. 1, 2, 3, 4. In these four examples of disease of the larynx, we see the nature of the membrane of CROUP. It is formed by inflammation of the membrane lining the larynx and trachea, by which a proportion of coagulable lymph

larynx will cause suffocation. See an example in "Bulletin de la faculté de Medicine, 1814, par M. Chaussier."

* And here I may observe, that those practitioners, who only occasionally visit the capital, will ever find a ready admission to the Museum in Windmill-street, and a gentleman to direct them to the objects of inquiry, in reference to this work. To those members of the profession who reside in town, the Museum will be open, during the winter, from eleven till twelve in the forenoon, twice a week. By this arrangement I shall find myself more at liberty to refer to those things which are open to public inspection, without overloading the work with engravings.

[more or less, according to the violence of the inflammatory action] is added to the mucous secretion. Accordingly, it assumes in one instance, [N°. 1], the appearance of concreted mucus; in another, [N°. 4], the character of coagulable lymph.

In contemplating these preparations, it must be particularly gratifying to reflect, that by the important communicaton of Mr. Chevalier, we are authorized in recommending an operation which, in such cases, promises perfect relief. I have seen much of this disease, and have examined the parts in not less than fifteen cases; it has not appeared to me that it was the violence of the inflammation which destroyed the patient, nor the irritation directly from the inflamed membrane, but that the presence of this secreted membrane, acting like a foreign body, at the same time occasions spasms in the glottis, obstructs the passage and confines the mucus. But I am bound to state, in the strongest terms, that death is ultimately a consequence of effusion in the lungs, occasioned by the continued struggle and difficulty: for on opening the chest, I have uniformly found that the lungs did not collapse, and that the bronchi were full of mucus; this corresponds with the symptoms; for, before death, the violence of the cough and struggle has given place to coldness and insensibility, with a pale swelling of the face and neck;

and when the child has fallen into this state, giving freedom to the trachea will be of no avail.

XI. 1. M. 5. The next example is the larynx of a gentleman who died of CYNANCHE LARYNGEA, and on whom the operation of laryngotomy was performed, without giving relief. I did not attend the patient, but received the trachea whilst still fresh. The membrane lining the larynx was swoln and inflamed; the whole membrane, which is now pale and shrivelled, was tumid, so that the sides of the passage were in contact.

The friend who gave me the preparation, and who performed the operation, not aware of the rapid course of the disease, permitted it to run too far before he thought himself authorized to operate. The stage of redness of the face, and protuberance of the eyes, and of great struggle and difficulty of breathing, had been succeeded by a pale turgescence of the face; a certain degree of insensibility; and the head lay upon the shoulder. The operation was therefore too late; effusion had already taken place in the lungs, and perhaps it may appear in a latter part of this paper, that a different manner of operating from that employed here, viz. thrusting a tube into the larynx, might have had better success in relieving the windpipe.

XI. 1. M. 6, 7, 8. These preparations exhibit the effect of a more chronic inflammation of the epiglottis and inner surface of the larynx, in

the adult. The membrane is thickened, and the the surface covered with an irregular crust of coagulable lymph.

Thus we already distinguish distinct diseases under the common term of CYNANCHE LARYNGEA. 1. The croup of children, N°. 1, 2, 3. The same disease in the adult, N°. 4. The acute inflammation of the larynx in the adult, N°. 5, and the chronic or less acute inflammation of the same parts, N°. 6, 7, 8, 9*, 11, 12.

XI. 1. M. 13, 14, 15. These three preparations exhibit the chronic inflammation and ulcer of the larynx and trachea, in the disease which deserves the name of *Phthysis Laryngea.*

XI. I. M. 16. An ulcer within the *Sacculus Laryngis.* This preparation is very interesting, as it explains several others of the series. In passing through the physician's ward my attention was arrested by the manner of breathing of one of the patients, and I took the following note :

FIRST NOTE. —— *Weymouth*, a woman 55 years of age, has been ill of what she terms an

* We must take care to distinguish facts from opinions. I believe, however, that these are examples of the inflammation of the epiglottis, described by Sir Everard Home. Also, by Dr. Robt. Watt, of Glasgow.

asthma and hoarseness, for three months. Having been a patient of a dispensary, she had her throat at one time blistered; on another occasion she had her throat and neck covered with pustules by the use of an ointment. She has at present a short cough, which occasions her to spit to the amount of half a pint during the night. Her difficulty of breathing is continual; but at intervals she has a more violent paroxysm, and then she struggles to get at the window gasping for air. She speaks in a whisper, the sound being husky or reedy, and very feeble. There is pain in the throat, and in describing its seat she puts her finger on the thyroid cartilage—the pain is increased when this cartilage is pressed, and she swallows with difficulty.

Second note. This woman died last night; I saw her an hour before she died: she did not seem in more distress than I had witnessed many times before in passing to the patient presently to be described, who was in the agonies of suffocation. She was very pale, was anxious, but lay reclined upon her pillow with nothing of the stir or struggle, or gasping of her neighbour. I was surprised to find in the morning that she had died, and without any struggle to occasion particular remark, from the nurses or patients in the ward.

Dissection. The larynx around the *chordæ vocales* was ulcerated, and strings of coagulable

lymph passed across the part; a bony portion of the thyroid cartilage was necrosed, and hung loose in the remains of what had been the sacculus laryngis, and such accretion of coagulable lymph had taken place, that the passage of the larynx was nearly closed. Marks of chronic inflammation were upon the inside of the trachea; the lungs did not collapse when the chest was open: when their substance was cut into, much frothy mucus escaped, and the fluid continued a long time to flow from the bronchi. Some tubercles were distinguishable in the lungs, and the pericardium contained water.

XI. 1. M. 17. This preparation exhibits an ulcer in the sacculus laryngis, very much resembling the former. The patient was worn out by a purulent cough.

XI. 1. M. 18. An ulcer of the sacculus laryngis, which has eat deep with a sharp defined edge. It is like a venereal ulcer.

XI. 1. M. 19. An ulcer of the glottis, supposed to be venereal. The circumstances of the case are very interesting. See p. 32.

XI. 1. M. 10. Ulcer in the glottis, and abscesses around the thyroid cartilage. Laryngotomy was performed betwixt the thyroid and cricoid cartilages.

From these preparations it may be inferred, that ulceration of the glottis is a frequent complaint, and by the circumstances of cases presently to be detailed, it will be made evident that this is a fatal disease, if not remedied. Further, it appears that there are two kinds of ulcer, affecting this part: 1. A slow chronic ulcer, probably scrofulous. 2. And another venereal.

These preparations exhibit the ravages of a disease which is much more frequent than practitioners seem to be aware of, a disease which deserves the name of *Phthysis Laryngea*, for it has all the consequences of true phthysis. The glandular structure of the trachea and larynx is the seat of this disease, the glands become enlarged, then ulcerate, and throw out purulent secretion. When the trachea only is affected, the disease is protracted; when it affects the larynx, it more rapidly exhausts the patient. This disease makes its attack gradually; there is a wheezing and troublesome cough; a purulent, and sometimes a bloody sputum, succeeds, with painful spasm in the throat, frequent spasmodic cough, breathlessness, and loss of voice. These primary symptoms are succeeded by pain in the chest, from the labour of respiration, and finally, the lungs are oppressed by effusion *.

* There is a preparation [*belonging to another series, XIII. 2. M.* 3.] which exhibits a singular example of a bone in the

It is most worthy of remark, that these patients die from disease of trachea or larynx, in truth, from suffocation, without the nature of their disease being adverted to. It is considered as mere debility. The cause of this mistake is, that there is not the usual character of suffocation. A cold leucophlegmatic state, with paleness, insensibility, and langour, ushers in death; instead of the violence and struggles which usually characterize suffocation. This however is not always the manner of death of such patients, of which the following is an example.

SUFFOCATION

FROM

DISEASE OF THE LARYNX,

IN WHICH THE

Operation of Laryngotomy was performed.

August 3d, 1815.—I was called up to the Hospital last night, to a patient of Dr. Latham's, who

throat, which proves to be the *Os Hyoides*, dead and projecting through the pharynx.

This woman was 35 years of age; she had been troubled with sore throat and cough for sixteen weeks. For six weeks before her death she had an incessant cough, and expectorated a very

was suffocating. I found a woman sitting up in bed, breathing with great difficulty, and with a noise which was heard over all that side of the house. She could speak in a whisper. I asked her the seat of her distress and difficulty of breathing; she put her fingers on each side of her throat, high up;—had she pain any where? she put the tips of her fingers to the pit of her stomach, bending forward in a manner sufficiently expressive. I observed that there was great labour of the muscles of the chest; that her breath came whistling as through a reed, and that, when agitated, her breathing had a harsh sawing sound. She had been received into the Hospital in the morning, her neck was sore with blisters. Leeches had been applied, and the blood was still flowing. Of the history I could obtain nothing, but only that the difficulty of breathing had been increasing for three weeks; that it was progressively worse, with no intermission. I was impressed with the necessity of giving this woman immediate relief. She was exhausted and pale with suffering, anxiety, and watching; and the respiratory machine was in such violent and incessant operation, that effusion into the lungs must soon

great quantity of offensive matter. In this latter period she could not swallow solids, not even a bit of bread, but lived entirely on fluids; she died three days after delivery of a child at the seventh month. She breathed easily, and was supposed to die from excessive weakness and inanition

have taken place ; my fear was, that this had happened already.

Having prepared what variety of apparatus the time admitted of, I made an incision two inches in length, on the fore part of the throat ; she was sitting up, for she could not lie down, and the blood fell upon her breast, leaving the wound clear. I stopt and encouraged her ; not without hopes that this effectual bleeding would be of service : and she did breathe with somewhat more ease. I now dissected on the fore part of the trachea, cutting very deep, and much blood flowed.

At this time an appearance presented itself, which should be taken notice of, and if authors had written only after actual experience of operation, it would have been pointedly observed. The sterno-hyoidei and sterno-thyroidei muscles were powerfully in action during each inspiration ; and they raised themselves into an appearance of two round columns, and by their starting forwards gave an unusual depth to the trachea. Every touch of the knife on the front of the trachea, brought a flow of blood, and I saw that it would be most inconvenient, if not dangerous, to open the trachea.

Although I had cleared the trachea on the fore part, just below the isthmus of the thyroid gland, I did not choose to perforate here ; the breathing was rapid, and at each inspiration the muscles of the throat started out, and the trachea was drawn backward and downward, so that the variation in

depth of the trachea was not less than an inch in inspiration and expiration. This motion I foresaw would baffle my endeavours to adapt tubes or other instruments to the perforation of the windpipe. I therefore enlarged the wound a very little upward, laid down the isthmus of the thyroid gland, and exposed the space betwixt the cricoid and thyroid cartilages. I then pushed a sharp bistoury into the membrane, which closes the interstice betwixt these cartilages. As soon as this was done, the air in expiration came forcibly and audibly out, spurting the secretion from the hole; nothing could more forcibly shew the necessity of the incision. I turned the bistoury upwards and downwards, enlarging the slit as far as possible without cutting the cartilages. I next introduced a spatula, and turning it round, opened the slit; immediately the harsh sawing sound of the air in the contracted glottis ceased, and the air played easily with a siffling sound through the wound. Very soon the woman relaxed all her exertions, and her eye-lids closed. I thought she had fainted or was dying; but the poor exhausted creature had dropt into a sleep where she sat, relieved from the necessity of exertion and from the sense of suffocation, even the novelty of her situation did not prevent her from falling asleep.

Having remained a very considerable time holding the instrument in the opening of the larynx, I proceeded to execute my final purpose. I made a transverse slit in the membrane, and introduced

the tube, being such as is commonly found in the shops, but the breathing was instantly stopt, a struggle commenced, and the tube was thrust out like a cork from a bottle. I saw this would not do, and I was forced to bend a catheter wire, so that the middle part of it lay in the wound, and kept the parts open, while the ends of the wire were bent round her neck, and tied by a ligature behind.

I left her at two in the morning, the house surgeon and apothecary remaining in attendance. She slept calmly, supported by pillows: this support being more required, from the precarious nature of the apparatus, than from the state of her suffering.

4th August. She breathes well, though not so softly; much bloody mucus is expectorated through the wound. Further attempts to adopt a more secure apparatus were now made. I had the tube perforated with large holes to let the air pass freely through it in all directions; but on introducing it, it was still unsuitable, it did not give freedom to the respiration; she forced me to desist, thrusting every thing from her: to let her breathe freely, I introduced the dressing forceps, and extending them, the lips of the opening were kept asunder, and she breathed again with composure.

The wire was again adjusted and introduced, and it had this advantage, that in introducing it,

the air was not interrupted; while every attempt with the tube gave obstruction to the breathing, and confined the mucus.

5th August. She has passed a good night; her pulse has fallen considerably; her breathing is with less effort and less hurried.

7th August. The wire has hitherto done its business very well; but now it is too sharp upon the side of the wound, and I have adopted a proper instrument. This instrument consists of two flat pieces of steel, connected at one end by a hinge, and by means of a screw passing through them near the hinge, the further extremities are separated; the extremities of the branches are averted a little, so that when introduced into the opening of the larynx they are not apt to fall out; and being expanded by a turn of the screw, they open the wound to a due degree, and by the same means the instrument is fixed; it is very light, and requires no bandage round the neck: with this introduced she breathes very freely.

10*th August.* Yesterday she was breathing with difficulty: on going to her she held up her hands imploringly. I leant with my ear close to her lips, and could hear her say—wind, wind! On looking into the wound I saw that the granulations had shot across, so as to diminish the aperture, I took out the instrument, and with a

fine hook and scissors snipt off the granulations, which restored the free passage for the air, and again she breathed inaudibly. This morning she is better than I have seen her at any time. She sleeps with her head upon the pillow; she eats raw eggs, milk, and tea; her face is pale but natural; she breathes freely; there is not the slightest amendment in the original disease in the larynx, although the purulent and bloody expectoration has ceased: now she brings up a pure mucus.

11*th August.* She continues easy. She is thin and pale, which is the natural character of her visage, but she is very contented. When I saw her to day, my dresser had withdrawn the instrument, notwithstanding which she breathes without noise. I made him put his thumb upon the wound, and found that she could speak better than formerly.

12*th August.* I withdrew the instrument today, and cut off two projecting granulations; they projected so as to play in the wind, and make a noise as she breathed.

13*th August.* This morning I took out the instrument, and said that in future she should do without it. On this I saw her in a great agitation, lifting her eyes and wringing her hands. I thought she was grateful for the relief; but, by the

nurses' interpretation, I discovered that it was horror at the suffering she anticipated from the want of it. In the evening I found that the instrument had not been taken out a few minutes before, she became restless and anxious to have it replaced. Just now, on coming to her, she makes me understand that she is breathing with great difficulty. I took out the instrument, and found adhering to it a mass of firm concreted mucus, which nearly closed the trachea.

18*th August.* After an absence of three days, on returning to town, I find my patient much better; the instrument is still in the wound; she walks about the ward, holds her tea kettle on the fire, makes her tea, and is attentive to all her little comforts, which is in strong contrast with her former wildness of manner.

I closed the passage to-day, and made her try to breathe through her mouth: she forced the air through her mouth, but with such exertion, that she would have suffocated in five minutes, had she not had the artificial passage.

21*st August.* This woman's original complaint is not essentially better, and all our endeavours will be useless. This afternoon she was nearly suffocated, but she is again breathing easily: these occasional obstructions are owing to the quantity of mucous secretion which plugs up the trachea; the air drawn through the natural pas-

sages of the nostrils and the mouth comes softened into the windpipe: but here it is drawn into the opening so directly and so dry, that it inspissates and hardens the mucus.

24*th August.* She looks still better; her face natural; putting my finger on the wound, I bade her blow out a candle, which, after a trial or two, she did with much delight. The granulations being troublesome, a new instrument is introduced, through which she breathes softly: it is a curious exhibition to observe a patient let fall a few drops of water into the windpipe, in order to breathe more freely! but this confirms my remark that the dryness of the air distresses her. She wraps a little lint about the probe, dips it into water, and then plays it in the wound, thrusting it into the windpipe, that the water may drop into the tube, and facilitate the expectoration of mucus.

28*th August.* Finding no amendment in the disease, and aware that this state could not continue, I passed a bougie from the wound upwards into the glottis; she could not bear it an instant, and it produced a violent fit of coughing. I thought of introducing an elastic tube from the mouth into the trachea, but as I suspected, the bougie could not be borne for an instant. Her danger is still from an accumulated load of mucus. A funnel having been placed inverted over the

wound, I have made her breathe through an inhaler, which has given much relief.

This poor woman is dead, after living seven weeks breathing through the artificial opening; for the last two or three days there has been more irritability of constitution and temper exhibited. She has complained much of want of breath, and shown unusual impatience. Last night she was seized with great difficulty of breathing, ran frantic about the ward, lay or fell down upon the floor, and with much violence tore the instrument from her throat, and was suffocated.

Her usual careful attendants, Mr. Dehane and Mr. Heath, were called from their beds, and attempted to restore her by the apparatus of the Humane Society, but she was dead.

The larynx of this woman is preserved, and already enumerated. XI. 1. M. 10.

A loose spongy granulation sprung from the sacculus laryngis of the left side, and lay completely closing the chink of the glottis; beneath this there was a deep ulcer; and within the thyroid cartilage were several ulcers; on both lateral faces of the thyroid cartilage there were abscesses, these abscesses communicated with the ulcers within, the centre part of the cartilage on both sides, being destroyed by absorption. The lungs were free from disease, but having been blown into in the attempt to recover the woman, I could not form a just estimate of their condition.

SECOND CASE OF SUFFOCATION,

FROM

Ulcer of the Glottis.

Mary Ann Mellon. Mr. Heath, our apothecary, the same intelligent gentleman who so kindly attended the last patient, heard this unfortunate girl in the street, calling to her companion, or rather attempting to do so. He was familiar with the peculiar husky sound, and by that, knowing her condition, he spoke to her, and desired her to come to the Hospital. Some days afterwards she took his advice.

On the 6th of March she came to the Hospital, and was seen by Dr. Southey. On the 12th of the same month she returned, and was taken into the house. The day before this she was walking in the streets, at her usual pace. She walked to the Hospital, carrying her bundle; in going up stairs she stopt to recover breath; she was full of anxious inquiries, and said that she must surely die.

Half an hour after coming into the Hospital, and sitting on her bed, she fell suddenly back, and died without a struggle.

The apothecary and house-surgeon were immediately called. They perforated the larynx, and introduced the pipe of the apparatus of the Humane Society, but their efforts were unavailing.

It was remarked, that when the incision was made into the larynx, the air rushed out with great violence from the hole.

On *Dissection* it was found, that the epiglottis was destroyed by ulceration, and there was a deep foul ulcer within the false glottis. [XI. 1. B. 37.]

On inquiring into this girl's condition, her friends said that her sore throat began about fifteen months ago, like a quinsy; that it was not treated as a venereal sore throat; that before this she could sing, but never afterwards. She had a hacking cough, and expectorated a great deal. Further, it appeared that she had been in the Lock Hospital six months, six years ago; a year after this she had been in St. Bartholomew's Hospital; and eighteen months ago she was in the Middlesex Hospital; and lastly, she was under the physicians in St. George's Hospital, about six months before her death.

If I had had an opportunity of performing laryngotomy in this case, I would have done it, and then have proceeded as in the following instance.

THIRD CASE

OF

DISEASE OF THE LARYNX.

Threatened Suffocation averted.

Fanny Murray, æt. 25, Regent's Ward. A few days ago Dr. Southey sent this girl, then an out-patient, to be examined, and as a case deserving to be watched. I immediately recognised the symptoms in the case of Mellon. She spoke in a whisper scarcely audible, and with great effort; when desiring to be heard, she made an effort like a cough; I put my finger into the glottis, and felt it rough.

April 18*th*. I was requested by Dr. Southey to visit his patient. She has been brought into the Hospital very unwillingly, and is in imminent danger of suffocation. Her sense of danger has led her to the Hospital.

Since Christmas she has been ill; she was at that time attacked with cold and sore-throat, and from the beginning she could speak only in a whisper. Her voice has never returned, and at present her whispers are scarcely audible. She coughs in a very singular manner; she says it is an inward cough; it is the exertion of coughing without the sound. This I imagine to be produced by

the want of action in the slit of the glottis, by which the air should be somewhat impeded, and thereby more forcibly sent through the glottis. She has pain at the pit of her stomach and in the loins, which I attribute to the exertion and fatigue of coughing. For this three nights she has not been able to lie down in bed. She expectorates a great deal: it is mucus and pus. Pulse 63, br. 42 in the minute. Her breathing has a harsh sawing sound.

Evening of the 18*th.* The Hospital attendants becoming alarmed at the condition of this woman, I was sent for at 11 o'clock. She was sitting up in bed, breathing with much difficulty; but her countenance was of a red colour, the violence of the fit had subsided, and the blueness had been succeeded by redness and fullness. Dr. Southey came in. We wished to see her swallow: she tried a little broth; much of it went into the windpipe, and she had a great struggle in recovering. We concluded that the epiglottis was eaten away by ulceration.

I proposed mercurial fumigation, but my colleague did not expect benefit from it, as the patient had been three weeks under salivation without the slightest advantage. Having ascertained, by putting my finger over the root of the tongue into the glottis, that it was rough and irregular with ulceration, I proposed to touch the surface with

the argentum nitratum. It was considered hazardous, but something was necessary, and I was confident that the application would allay irritation.

I made a small pad of lint, and attached it to the ring of a catheter wire, and bent the wire so as to pass over the root of the tongue and epiglottis; I dipped the lint in a solution of twenty grains of the caustic to half an ounce of water, and touched the glottis with it in this manner. With the fingers of my left hand I pressed down the tongue, and stretched the forefinger over the epiglottis, then directing the wire along my finger, I removed the point of the finger from the glottis, and introduced the pad of lint into the opening, and pressed it with my finger.

On withdrawing the lint, instead of coughing she began to speak more audibly than usual, and had neither cough nor spasm from this rough operation. I repeated the application four times, and her breathing was sensibly better when I left her.

19*th*. This morning, at the visit, I found her considerably better. I touched the chink of the glottis again with the same solutions. I recommended issues to be made on the sides of the throat.

20*th*. The issues not made. Last night it was

reported to me that she was not so well, but this morning I find her remarkably better. I again touched the glottis with the solution of caustic, notwithstanding she complains of soreness of the mouth from the former applications; it had the same good effect, improving her breathing as formerly. A pill of belladonna is ordered, and she is to smoke the stramonium: she is to put her feet and legs in the nitro-muriatic bath twice a day.

22*d*. She has had the acid bath to her feet several times, and has been twice in the sliper bath, with the acid more diluted, and the fluid reaching to her loins. She speaks with more force, coughs less. Still she does not swallow better.

26*th*. At Dr. Southey's request I again touched the glottis with the caustic solution. I applied it as strong as it could be made. The girl is frightened, but better.

29*th*. This girl is remarkably better; she has taken the bath twice a day; her gums are sore, swollen, and of a dark red colour. Her countenance is much amended; she breathes without noise, and can swallow better than she did.

May 4*th*. She can swallow better; she breathes easily: but she is full of complaints and uneasiness. Her mouth and throat are much inflamed, the gums dark, coloured, and spongy.

She is to take the nitro-muriatic bath every second night.

5th. The bath to be altogether omitted. Dr. Scott visited this patient; he never saw the mouth so sore from the operation of this remedy.

30*th.* I examined this girl yesterday, and find her almost well. She says that she has not been so well for years as she now finds herself. Her countenance is indeed that of health. In swallowing, she takes five or six draughts in rapid succession; but when she swallows leisurely a single mouthful, as I made her do to-day, she does it without coughing.

Some weeks after this Report, Fanny Murray placed herself in the way of the surgeon's round, and gave me her thanks in a very eloquent manner, to the amusement of the pupils; and next day she took an unceremonious leave of the Hospital*.

* Although her physician had watched her with the most humane attention, my desire of witnessing the effects of the new remedy had won upon the girl's gratitude.

AN

ULCER OF THE THROAT,

WHICH OPENED THE

Internal Carotid Artery.

THE last preparation of the series of ulcers of the glottis may be noticed as emphatically closing this account, and sufficiently exposing the danger of disease here. I received this specimen from Mr. Golden of Maidenhead. In the winter, 1805, a woman, thirty-five years of age, was admitted into the Hospital; she was spitting blood, and coughing in a manner that left no doubt of the case being *hemoptoe*. She died three hours after being admitted. In dissecting, to display the anatomy of the neck, Mr. Golden discovered that the internal carotid artery communicated with an ulcer of the throat. The preparation exhibits a very deep and ragged ulcer, making an irregular cavity, which communicates with the throat by an opening at the root of the epiglottis, and with the internal carotid artery, at the place it bends in to hide itself by the side of the throat.

These facts drawn from morbid anatomy, and these cases, will perhaps lead my reader to conclude with me, that venereal ulceration of the larynx is a more frequent and alarming symptom

than is generally believed. Further examples of sudden death, from the same cause, in those of a higher rank might be given, but I do not feel myself at liberty to make the statement. My reader will have guessed upon what analogy I proceeded in applying the caustic to the sore within the chink of the glottis.—1. The relief from the solution in common sores: 2. the relief in ulcers of the cornea: 3. the relief from the application of caustic to irritable spots of the urethra.

Of the use of the nitro-muriatic bath I shall hereafter have occasion to speak; the fact is here forcibly enough announced, that it is a powerful agent; and of the other means to be employed in disease of the larynx, see the case of *Nichols*.

SYMPTOMS

OF

ULCER IN THE GLOTTIS,

IMITATED IN

Hysteria.

When I delivered my clinical lecture on the ulcer of the glottis, I took occasion to draw the attention of the students to the following case, in the way of precaution, and in order to lead them to make accurate distinctions of diseases. It may be useful to my younger readers.

22d March. "Last night one of the gentlemen of the Hospital came to me with great urgency, requesting me to come up quickly to the Hospital, as there was a young woman suffocating. As we had lost a young woman by suffocation only the week before, I partook of the gentlemen's anxiety.

"I found a young woman, about one-and-twenty, lying in a state of torpor, with her mouth open, and breathing with a crowing sound as in croup, and appearing indeed as if she would suffer instant suffocation.

"The difficulty was in drawing the breath, and it exactly resembled the breathing in inflammatory croup; and the glottis appeared strictured in some way, for the air was evidently impeded in a restricted orifice. For a moment I thought an operation would be required. But when I more attentively observed the manner in which the girl lay, reclined on her back, with the countenance of a natural colour, and the vermilion in her lips; when I found that she was not quite sensible, and that there was no catch or struggle of the muscles of the chest, I saw that it was a hysterical affection, and on making the pupils refer to the physicians' books, we found that she had been treated as for a spasmodic disease.

"Next morning I visited her more from curiosity than the idea that she wanted my assistance. Her difficulty of breathing had quite left her, but

she could not pass a drop of urine. The spasmodic affection of the muscles of the glottis had shifted to the neck of the bladder.

"This, gentlemen, may remind you of what Sydenham has said, that there is no character of disease which hysteria will not occasionally assume. And let it be to you an example of the necessity of guarding your judgment from the bias of two recent impressions. You have been so impressed with the late occurrences, that you have made a case of imminent danger out of the casual symptom of an hysterical girl *."

Here I should have added a case of aneurism pressing upon the bifurcation of the trachea, because the symptoms resembled those of the *cynanche trachealis chronica;* but upon the whole, the facts fall to be arranged under another report. I owe the valuable preparation and the case to my colleague, Dr. Latham, XIII. M. 21.

Before entering critically on the consideration of the operation of laryngotomy, I shall present some short observations, although in an insulated manner, on the wounds of the trachea and larynx.

XI. 1. B. 40. The larynx of a suicide. This

* This young woman was also under my colleague, Dr. Southey, and presented altogether an interesting case. She was dismissed cured.

young man made six cuts on the fore part of the larynx: so many notches are seen upon the cartilages. The arteries have been injected, and all the branches are entire; notwithstanding that none even of the considerable branches of the thyroid artery are cut, yet he bled in secret for three hours and died of hœmorrhage.

There are two things in this case worthy of notice. 1. It ought to be recollected that in all operations of the fore part of the neck, the thyroid gland ought to be avoided; for such is the activity of its vessels, that when touched with the knife it bleeds with surprising activity. 2. In the next place, surgeons, and I believe many anatomists also, are ignorant of the SUPERIOR LOBE OF THE THYROID GLAND. This lobe certainly is not always to be met with, but it exists so frequently as to make it an object in operation. This lobe is attached to the anterior and lateral part of the gland, and stretches upwards on the side and fore part of the cyrcoid cartilage. It was this part of the thyroid gland which was cut and notched in this instance, and from it this great quantity of blood flowed.

Since I have been drawn to mention this lobe of the thyroid gland, I may take notice that there is a muscle (which I believe is not described) to be met with here. It descends from the os hyoides, and expands upon the great lobe of the thyroid gland.

I have a preparation before me, which by the

kindness of my colleague, Mr. Cartwright, I have an opportunity of placing in this series. A young woman in phrensy plunged a penknife into her throat. The point of the knife pierced the upper part of the thyroid cartilage, so that it entered at the union of the *chordæ vocales*. Yet it is worthy of notice that she died not in consequence of the inflammation and irritation from the wound. She was suffocated at the distance of some months by the granulations which arose from the edge of the wound, and which filled up the passage of the glottis. This is a circumstance of great interest, and in the case of laryngotomy which I have detailed, it will be seen how much the granulations endangered the patient's life. In the present example we have a simple wound of the larynx where there was no disease, finally causing suffocation after the patient was enabled to go about her usual occupations, and at the distance of some months from the infliction of the wound. This instance of death by suffocation in the suicide, reminds me of the necessity of performing the operation of laryngotomy or bronchotomy on those who have cut their throats, as well as in some cases where they have perpetrated the act by firing a pistol into the mouth.

Within these few months a man was brought into the Middlesex Hospital who had cut his throat. There were times when he suffered violently from difficulty of breathing, and then a flapping of something in the throat could be heard.

He died; and it was discovered that the knife had gone so critically that it divided one of the arytenoid cartilages, and the portion hung by the membrane so as to vibrate in the chink of the glottis like a pea in a cat-call: and acting as a foreign body caught in the rima glottidis, it occasioned suffocation; nor is this a singular occurrence.

Another instance of death from a wound of the trachea occurred in the Middlesex Hospital, which is very interesting, as it shews the consequences of dividing the cartilages of the trachea. A young woman resolving to destroy herself pushed a penknife into the fore part of her throat, and drew it downwards, cutting through five of the rings of the trachea. She survived the first effects of this wound—but was suffocated by the retraction of the cut edges of the cartilages, and the swelling of the inner membrane, which thereby diminished the capacity of the tube. This patient was also under Mr. Cartwright's care, and by his kindness the preparation is before me.

REMARKS

ON THE

Operation of Laryngotomy.

We may perceive that the occasions for opening the larynx or trachea are very frequent; and that

the time of affording relief is lost by the surgeon entertaining too formidable a notion of the operation. I therefore conceive it to be of the first consequence to make this operation simple, and to divest it of its terrors, in order that it may be had recourse to in good time to be of use.

For the most part it requires only a small scalpel to cut into the membraneous space betwixt the thyroid and cyrcoid cartilages. And having slit up the membrane, substituting the handle for the point of the knife, and turning it round so as to open the slit, immediately the patient breathes freely. There is here nothing to alarm the most timid operator. No great turgid veins are opened; he is above the thyroid gland, and above the anastomosing branch of the thyroid arteries. The part is strongly marked by the prominence of the thyroid cartilage above, and the ring of the cyrcoid cartilage below.

If the occasion be temporary a simple slit of the membrane will be found sufficient. If necessary a transverse cut will afford any degree of opening. If a round hole be desired the four corners left by the incisions may be snipt off, and then there is sufficient gap! or such an instrument as I have used may be introduced.

I see it observed in the last volume of the Transactions of the Medico-chirurgical Society, that in my operation I was obliged to enlarge the opening. A further incision was made after the woman had breathed through the opening for six

weeks; and what is more it was insufficient when done: for as experience proved, the enlargement of the opening did not relieve her distress; the difficulty proceeded from another cause, the progress of the disease itself.

Objections are also made by Mr. Lawrence to the instruments which I employed. But my patient was often by accident reduced to the state of Hannah May, p. 228, vol. 6, of the same Transactions; and would have died, but she was immediately relieved by the introduction of the instrument, and was most grateful for the relief.

That the operation ought to be performed betwixt the cartilages in cases of threatened suffocation from husk of fruit, cherry stones, and the like, drawn into the glottis, is obvious both because it gives immediate freedom to the respiration, and because it permits us to extract the body, or to push it up into the mouth.

Whatever other part of the throat we cut upon much blood must flow. If we cut through the cyrcoid cartilage, we come upon a branch of the thyroid artery, and perhaps the superior lobe of the thyroid gland; a very little lower we cut upon the isthmus of the thyroid gland, which pours out blood like an artery, but cannot be secured by a ligature like an artery.

If we cut on the fore part of the trachea further down than the thyroid gland, we are confined in a narrow space. The trachea is deep, and the thyroid veins as they descend are found so turgid,

owing to the difficult respiration, that they bleed very freely. The bleeding makes the operation bustling instead of being done quietly; and there is considerable danger in opening the trachea while the bleeding continues, lest it fall into the trachea, and with the accumulated mucus suffocate the patient.

I have objections to cutting out a portion of the cartilage, because it commits more injury to the parts than appears to me necessary, and because it makes a hole which it requires a process of granulation to fill up, and especially, because it affords a greater facility for the granulations to project into the larynx, and to obstruct the canal.

Anatomy and experiment give us very distinctly the great principle to be attended to in these diseases of the larynx. All obstructions have a spasmodic character; coming in paroxysms, whether the cause be irritation or mechanical pressure. An aneurism of the carotid, or a disease of the thyroid gland, or a foreign body sticking in the pharynx or larynx, is attended with a difficulty of breathing, which returns after intervals of ease, betraying its source to be an excited muscular action, a contraction of the muscles of the arytenoid cartilages. These muscles, by their operation on the *chordæ vocales*, close the rima glottidis, and impede the issue of the air. By the operation of laryngotomy, or tracheotomy, the air gets free passage, but the mischief remains: the acute and

peculiar sensibility enjoyed by the glottis, not only governs the muscles of the glottis, but also combines into action the whole muscles of respiration, and affects the lungs. Thus, though we give freedom to the trachea, if the cause of irritation remains; though the patient be saved for the time there is an influence, which, by continuing to disturb the office of the lungs, will ultimately destroy the patient. All that can be expected from bronchotomy is a temporary relief: if the disease continues, I think the patient must ultimately fall a sacrifice, in whatever manner the opening may be made. It has a natural disposition to close, and the means of opposing that disposition must produce irritation. My incision through the integuments was very large; yet in six days it began to contract, and granulations sprung out from the sides, which it was necessary to cut off again and again. Besides, the cut edge of the cartilage itself will, if not soon consolidated, throw out granulations, which may prove still more destructive, by diminishing the passage of the trachea.

These Observations may be summed up in the following QUERIES.

1. Are there not diseases of the larynx which have, in these latter periods, all the characters of pure pulmonic affections?

2. Are we enough aware of that progress of suffocation, in which the last train of symptoms, and the quiet manner of death, afford no indication of the nature of the disease, yet where spasmodic stricture of the glottis is the real, though the remote, cause of death?

3. Have surgeons always attended to the proper time for performing bronchotomy, and have they not thought of relieving the trachea, when already the lungs were irretrievably oppressed with mucus in the bronchi, and effusion in their cellular texture?

4. Has not the introduction of a tube into the larynx or trachea, sometimes defeated the object of the operation?

5. Are practitioners sufficiently aware, that the operation may be done with a lancet and the end of a tea-spoon, and in circumstances when the more complicated apparatus of a tube will cause suffocation?

6. In cutting out a portion of the larynx, or cutting the rings of the trachea, have we duly considered the danger of granulations projecting from the cut edge of the cartilage into the tube; or of the cartilages being curled or drawn in so as to diminish the calibre of the tube?

7. By one example it is proved, that a patient may breathe through an artificial passage for six weeks. But has not this wound, like all others, a disposition to heal? and will not the necessary counteraction of this tendency, by whatever means, produce irritation? Is not the operation therefore only a mode of giving temporary relief?

8. Since the exquisite sensibility of the glottis is bestowed, not only to excite the muscles of the arytenoid cartilages, and to close the glottis, but also to influence the lungs and to draw the respiratory muscles into action, may not a continual excitement of the glottis at last produce effusion in the lungs, although the windpipe be free for the transmission of air?

THIRD REPORT.

CASES

OF

Diseased Pharynx and Oesophagus,

WITH

OBSERVATIONS.

It would be a natural arrangement to class the diseases of the pharynx and œsophagus under the head of the alimentary canal; and perhaps this might conduce to the better illustration of the principles of pathology. But in my collection I have found it necessary to class together the natural and morbid anatomy of the neck; and when, as now, we consider the subject with a view to surgical practice, the pharynx and œsophagus stand closely related to the subject of the foregoing report on the diseases and wounds of the larynx. My reader may, perhaps, have the same difficulty in arranging the following case, that I myself, during the progress of the complaint, had in understanding to which division it should belong.

CASE

OF

SCIRRHOUS CONTRACTION

OF THE

Pharynx.

May 3d, 1816. *Jane Nichols*, aged 35. This woman was in the Hospital three weeks ago, and left it on some domestic occurrence. She is worse, and has returned in expectation of the same relief she formerly experienced. Her complaint was an obstruction to swallowing, attended with much pain during the effort, and a tumor of a bony firmness could be felt projecting from the larynx into the bag of the pharynx. Leeches were applied, and repeated blisters on the sides of her throat. She had a gentle vomit, and a course of the Plummer's pill. Under this course of treatment there was a very considerable amendment.

Neither formerly nor now can this woman give any intelligible account of the cause or beginning of this complaint. She thinks that she must have hurt her throat in swallowing; but there is no further evidence of this than the pain she has experienced in swallowing. She is married, has a family, and is decent in her appearance.

At present she complains of great difficulty of swallowing, and of something rising from her

throat towards the ear and back of the head. But she speaks very ignorantly, desiring to have something to bring down the substance to her throat, so as to give her ease.

I have made her attempt to swallow a little warm milk; she made great efforts to get over a little, pressing her hands against her ears expressive of great pain. This pain is obviously from the distention of the pharynx, and the consequent affection of the Eustachean tubes; for, she says, the pain flies to her ears. But as the left ear is most affected, and as the disease is felt most distinctly upon the left side of the pharynx, we may conclude that it is the pressure against the diseased part which communicates pain to the ear.

When I put my finger into her throat I can distinctly feel the epiglottis, and pushing the finger beyond this I can distinguish the left side of the false glottis to be irregular and tuberculated; but I think not ulcerated. Still further back I can feel a tumor projecting into the pharynx, having its root on the back part of the larynx.

Finding so much disease of the pharynx, and that the patient was weak from defect of nourishment, I thought of introducing a tube into the œsophagus, so that she might be fed without producing the irritation consequent on the frequent action of swallowing. But on attempting the introduction of the tube, I found that it was obstructed, and that it gave too much pain and irritation to answer my intentions.

Ordered that six leeches be immediately applied to the neck, and after them a blister to both sides of the throat alternately. To-morrow evening six or four leeches to be applied as may then seem best, and the blister to be repeated. She is to smoke the stramonium. Her bowels to be opened by the house mixture, and the Plummer's pill to be given at night.

May 10*th.* She is considerably worse. She swallows with more difficulty and pain. The fluid she tries to swallow comes back by the nose, and during the attempt the pain shoots violently into her ears. The stramonium increases the secretion from the mouth, but she thinks it also increased the pain of the throat. It has been omitted.

Calomel and white sugar have been rubbed into the sides of the pharynx. With the forefinger of the left hand I press down the tongue and pull it forward, and wetting the finger of the right hand, and touching a powder of equal parts of sugar and calomel, I push it back into the throat, and rub it into the rough diseased surface. This has made her spit, and she is so sensible of the benefit which she derives from this practice, that she will not permit me to pass through the ward without entreaties to renew the operation. Yet I am not sure that this application is doing more than taking off the morbid irritation from the part.

29*th.* The calomel having made her mouth sore,

without producing permanent amendment, it was omitted. On each side of the throat, near the upper horn of the thyroid cartilage, a small issue has been made by caustic. Four hours after the application, there was an alarming attack of spasm in the throat which threatened suffocation.

31*st*. By the application of the cold solution to her neck, and an opiate draught, she was relieved; but being in the Hospital to-night, she sent for me to urge her great distress, and the necessity of having relief. I find her breathing remarkably affected. She complains of pain in the scorbiculus cordis. She draws her breath with a stridulous sound. I should be inclined to say that the sound is more indicative of a spasmodic or muscular stricture than of tightness from swelling of the membrane. On examining with the finger in the throat, I think the tumor of the glottis is sensibly increased. Leeches to be applied to the neck. The head and neck to be kept cool. An expectorant mixture of squills and gum ammoniac is ordered, as there is a deficiency of secretion about the throat.

5th of June. She says her swallowing is worse since the application of the caustics. Her breathing is short. She cannot lie down. There are frequent returns of the spasms, with rattling of secretion in the throat.

7th. This woman is much better to-night. I find her walking about the ward. Her voice no longer a whisper, but with the natural strength and reverberation of the voice. She swallows with more ease ; and, on the whole, expresses herself very much relieved, and as enjoying an unusual comfortable feeling.

16*th.* Being asked to compare her present state with what she formerly suffered, declares herself much better. She breathes easily. When she attempts to swallow milk, I observe that she makes many gulps or efforts before she can succeed in forcing it into the œsophagus.

23*d.* The issues are dressed with the blistering ointment, and kept very active. She is sensible of the relief they have afforded her. She is much better in all respects, and has undoubtedly been greatly benefited by the issues.

12*th of July.* Although relieved, she now makes no improvement. The alterative course has been persevered in. The issues have been kept active, and the œsophagus bougie passed with great care twice a week. Although by this means the swallowing is improved, and she has been able to take more regular nourishment, yet the trachea seems more affected.

16*th.* After being so long relieved, she has fallen

into a much worse condition. When I introduce my finger, I feel the tumor larger, harder, and more irregular. Her distress is more in breathing than in swallowing. No effort of mine can save her long. The passage into the stomach I could, perhaps, keep open, but the disease is making progress towards the glottis, and this I have no means of counteracting. She cannot lie down. She breathes with difficulty ; and it has been well observed by one of the pupils, that she does not breathe with the sound of debility and increased secretion of the throat, as one near her end, but more as if the air was drawn through a restricted passage. True, there is no rattle of secretion, but a siffling sound of the breath. She has requested to have a blister put to the pit of her stomach. She thinks it will ease the pain there ; but that pain is from the labour of respiration, and cannot be so relieved.

Afternoon. The cough is frequent, and throws her into deliquium. Her countenance, long very thin, is now full of anxiety and great suffering. It indicates that she cannot long survive, but must sink from imperfect nourishment, and the labour of impeded respiration.

17*th.* Respiration 26. Pulse 120, very irregular, weak, and small.

18*th.* Died at six in the evening.

On *Dissection* it was found, that the disease had its seat in the membrane of the pharynx, and from thence had spread to the œsophagus, on one side, and the larynx on the other. Scirrhous tumors of great firmness and whiteness, so studded the pharynx and beginning of the œsophagus, as to occupy and nearly close that part of the tube; one or two smaller white masses further down, betrayed a general disposition of the membrane. Where the membrane was reflected over the glottis into the trachea, it was found much thickened, white, and dense. And on looking through the larynx from below, two white tumors were seen projecting from the sides of the tube: these left a triangular opening so small, that it was wonderful this poor woman could breathe so long. The lymphatic glands on the side of the throat had partaken of the disease, and an abscess, with firm scirrhous walls, had formed in one of the lobes of the thyroid gland. The parts are numbered XIII. 2. M. 13.

PREPARATIONS IN THE COLLECTION,

Illustrative of the same Subject.

In the Collection, XIII. 2. M. distinguishes the specimens of disease in the *pharynx* and *œsophagus*. The thirteenth number of the series belongs to the last case.

XIII. 2. M. 4. Is a preparation exhibiting on one side a morbid thickening of the pharynx, with a degree of stricture at the commencement of the œsophagus; on the other, a large ulcer of the trachea with lymph on the larynx.

XIII. 2. M. 5. A preparation similar to the œsophagus of the last, presented by my friend Mr. Brodie.

XI. 1. M. 13. Exhibits the membrane of the pharynx thickened, with a degree of stricture; the trachea and larynx are rough with ulceration.

XIII. 2. M. 9. An example of scirrhous ulceration of the œsophagus. The disease occurs in this instance opposite the division of the trachea.

XIII. 2. M. 12. The œsophagus having soft pendulous tumors, growing from its inner surface. This preparation is engraved. Plate III.

XIII. 2. M. 11. The œsophagus obstructed by a tumor which has formed within its coats.

XIII. 2. M. 3. Example of obstruction to swallowing, from a singular cause: an ulcer of the pharynx has laid bare the os hyoides, so that the horn of the bone projects into the pharynx.

XIII. 2. M. 2. Through the pharynx a hole is

made by ulceration, which gave exit to the matter of an abscess, connected with the vertebræ of the neck.*

XIII. 2. M. 10. The thyroid gland being scirrhous, and enlarged, has pressed upon the lower part of the pharynx, so as to obstruct the tube.

XIII. 2. M. 14. An abscess on the thyroid cartilage, which communicates with the pharynx.

Remarks on the foregoing Examples.

The whole extent of the alimentary canal is subject to such diseases as I have here described, but it is only in the pharynx or œsophagus, or in the rectum, that they become interesting to the surgeon. The case of Nichols will convince you of the dreadful sufferings of the patients under these diseases, and the catalogue I have made will inform you of their variety.

The disease of Nichols was an exact parallel with the scirrho-contracted rectum, when it is extended to the neck of the bladder [of which examples will be given hereafter]. Instead of the difficulty of excluding the fæces, you have here the difficulty of swallowing: and for the spasms and obstruction of the neck of the bladder, there is

* See further, under the head of Injuries of the Spine.

here the spasms of the glottis, and the impediment to respiration.

It is a disease to which the glandular structure of the tube exposes it, and, as the glandular structure prevails most at the extremities of the canal, and as both the pharynx and rectum are more subject to injury than the other portions of the tube, so this disease most frequently occurs in those parts.

The scirrhous thickening of the coats of the pharynx produces so great a change, that they become incapable either of contraction or of relaxation. Although there be no *stricture* of the tube, it becomes incapable of transmitting the food into the stomach. In such a case as that, XIII. 2. M. 9. where the scirrhous ulceration has made the œsophagus much more capacious than natural, yet the continuity of the muscular action, by which the food is transmitted to the stomach, is interrupted, and a disease very different from stricture resembles it in the most essential circumstance—the incapacity of swallowing.

The scirrhous thickening of the pharynx or œsophagus, may certainly be much relieved by the use of the bougie, and frequent application of leeches to the side of the throat. The issue in the sides of the throat, and the bougies, will effect a cure where there is a mere thickening by common inflammation or scrofulous action. But where the disease, as in Nichols, is of a cancerous disposition, the relief must be very transitory.

You will not have failed to remark, that although the issues gave much relief in the end, yet

in their first application, and on the rising of the inflammation, they occasioned violent spasms in the muscles of the glottis. In this we see another point of analogy betwixt the throat and neck of the bladder, for by the severe application of caustic to the urethra, we have with the rising inflammation, spasm in the bladder, and inability to make water. And, independently of the effect of the issues, or any other application, you must have observed that there was a singular alternation of the affection of the pharynx and of the trachea, for at one time the swallowing was relieved, and the breathing worse: and when deglutition was performed with most pain, the breathing was easier. These changes serve to shew you how much of spasm there is in the affection of these parts, even when the disease is of a permanent and unchangeable nature.

We are apt sometimes to increase the difficulty of breathing and of swallowing by the very means we take to allay it. I was requested to come down to a surgeon a few miles in the country. He had written a very few emphatic words, declaring himself suffocating, and desiring me to bring down the instruments for bronchotomy. I found him lying in bed with an inflammatory sore throat, with a blister on each side of the neck, and his head wrapt in flannel. He breathed with exceeding difficulty. His face was tinged, he was in a high fever, and exceedingly alarmed.

The rising of the blisters, his position, and the heat, had so driven the blood to the head, that I

really thought he might have suffocated. But by lifting him up, and throwing off the covering from his head and neck, and sponging his face and neck with vinegar and water, and assuring him there was no danger, his breathing immediately became easy, and there was no longer thoughts of opening the wind-pipe. I have repeatedly seen this increase of arterial action from the application of a blister to the throat; and we have just seen the same effect take place from the application of caustics in the case of Nichols.

There is another circumstance which deserves my reader's attention, that is, the state of pregnancy and labour: for the exertion during the labour pains, sends the blood with such force to the head, that if there be any cause of difficult respiration, it will be greatly aggravated at such a time.

A

PRETERNATURAL BAG,

Formed by the Membrane of the Pharynx,

WHICH

IMPEDED THE INTRODUCTION OF THE BOUGIE.

A considerable time ago a gentleman called to consult me about a disease in his throat, which gave him great uneasiness, and occasioned difficulty of swallowing. In the course of conversation I found his anxious hopes rested on my being

able to pass a bougie into his stomach, by which he said he was always relieved of his uneasy sensations, and I could learn from him, that some ineffectual attempts had been lately made.

He sat down before me rather with the confidence of a man who was to be gratified, than one who was about to suffer a painful and disagreeable operation. I made many ineffectual attempts to pass the bougie into the œsophagus. In carrying the point towards the back part of the pharynx, I found an obstruction so absolute, that I could not venture to press with force. In introducing the bougie much curved, so as to avoid the obstruction on the back part, I still found it interrupted. I at last succeeded, by giving the instrument a twist laterally, which brought the point to pass by the side of the throat, and move along the lateral part of the pharynx. I observed, with some interest, that when the bougie was introduced, it was not grasped, nor were there any impressions on the soft wax.

Having got the way of introducing the bougie into this patient, he often returned to me, at the distance of a fortnight, and was always relieved by the passing of the bougie.

It was not till a year after this, and not indeed till after his death, that I found he was a gentleman of large fortune, who had his medical attendants at home, and that in delicacy to them he came in some measure clandestinely to me. Before his death he had said that I had taken great

interest in his case, which induced the friends to request me to examine his body. His death was not to be ascribed to the complaint in his throat, yet there was something there deserving notice.

I found a bag projecting from the lower and back part of the pharynx, and pushed into a space betwixt the œsophagus and spine. The bag was not covered with muscular fibres, but may be described as a hernia or protrusion of the inner coat of the pharynx, betwixt the strong fibres of the muscular coat.

Reflecting on former experience, it was evident that this bag was the cause of obstruction by receiving the end of the bougie. For when the instrument was directed backwards, the point of it must have entered the bag; and when carried in an opposite direction it must have passed into the chink of the glottis. When the bougie was directed laterally it escaped both these holes, and went down into the proper canal.

While this gentleman visited me his principal complaint was flatulence of the bowels, accompanied with spasm, which seemed to affect the whole tract of the canal, but principally the œsophagus. So distressing was this flatulence, that it prevented him from going into company. The necessity of passing the bougie he ascribed to the gradual accumulation of mucus, which the passing of the instrument enabled him to discharge. In fact there was such a deposit found in the bag; it was of a

consistence as if chalk in fine powder were mixed with the natural secretion.

The parts are represented in plate II. The preparation is marked XIII. 2. M. 1.

In the 3d volume of the Medical Observations and Inquiries there is a case of obstructed deglutition from a preternatural bag formed in the pharynx. The case is given in a letter addressed to Dr. Hunter, who by his many important communications, but above all by the influence of his superior mind, made that collection creditable and useful above all others.

Mr. Ludlow, the author of the paper to which I now direct your attention, states the case with great judgment, and proposes his conjectures of the cause of this derangement with much ingenuity. It appears from his description that he believed the bag to be muscular; for he says, "When the bag "was full it was immediately irritated probably by "the weight of its contents; and as the bag was "nothing more than a perfect continuation of the "coats of the pharynx, this irritation would be "instantly communicated upwards," &c. If the proof of its muscularity was the act of rejecting the morsel from the bag when an attempt was made to swallow, I would object to the statement; for I conceive that the muscles of the neck, and especially the platysma myoides and the muscles attached to the larynx would have the effect of pressing the larynx and pharynx against the spine, so as to squeeze and empty the bag. Indeed it is

not easy to conceive how a bag should form, being muscular, and therefore capable of resistance.—Although it be hazardous to form a conclusion from a single example, yet in saying that the bag is not muscular I am supported by very strong analogies.* I think that the bag is produced by a protrusion or hernia of the inner coat of the pharynx, through the fasciculi of the constrictor pharyngis.

Mr. Ludlow accounts for the formation of the bag by the accidental falling of a cherry-stone into the rugæ, or betwixt the loose folds of the pharynx. He supposes the cherry-stone to have been forced deeper by every successive morsel after its lodgment, and that by little and little, food also was forced into the bag, until at length it was enlarged so as to occupy a great space betwixt the œsophagus and spine. He proceeds more correctly to state, that when the food was carried backwards in the act of deglutition, the margin of the bag acting in the office of a valve, received the food; and the bag being thereby distended, it compressed the œsophagus, and made the descent into the stomach still more difficult.

The question is not, as I conceive, one of mere curiosity, but of practical importance; I shall therefore offer another explanation. This gentle-

* See examples in a future Report on the *sacculi* of the bladder.

man, whose case I have shortly related, was subject to a spasmodic difficulty of swallowing. In that state it often happens that the force of the voluntary muscles remains, while they are unable to overcome the spasm in the top of the œsophagus. There are then repeated ineffectual gulping or efforts to swallow, which distend the pharynx; and although by such excitement the muscular fibres acquire strength, yet their strength is like that of the bladder when stimulated by frequent nisus, the fibres form stronger and more distinct fasciculi, betwixt which, the inner membrane is permitted to be protruded.

When a patient is in the situation of this gentleman, the membrane may be protruded either by those ineffectual attempts which are followed by the regurgitation of the morsel; or by that action, which belongs to the complaint, the swallowing of air which is refused passage into the œsophagus, and which occasions a painful distention of the pharynx. During such efforts the distending fluid thrust the inner membrane of the pharynx betwixt the fibres or fasciculi of the muscular coat.

If a case were to occur in which I had ascertained the existence of such a bag before death, I should attempt the cure by syringing the sac with such astringent injection as would prove innoxious to the stomach if they happened to be swallowed, and by feeding the patient through a tube, so as to prevent the distention of the bag.

The Subject continued.

Since we have been led to consider the subject of sacs formed in connexion with the pharynx, it is my duty to remind you, that they may be formed in a very different manner from that explained above. We hear of abscesses bursting into the throat, and occasioning suffocation; but it is a mistake to suppose that it is the matter which suffocates; it is the irritation of the ulcer, by which the communication is formed with the larynx, that causes spasm, and consequent suffocation. When suppurations about the throat open into the pharynx, they also produce great inconvenience and distress. I have already noticed a preparation in my collection, which shows a communication betwixt an abscess around the spine and the pharynx. Other scrofulous suppurations, may open into the pharynx, and then there is increase of the suffering and danger. I remember to have seen a remarkable example of abscesses in communication with the pharynx, where I had afterwards an opportunity of examining the parts by dissection. The velum palati adhered to the back of the fauces, and at the same time a hole was opened in the palate by ulceration. From the pharynx two holes led into abscesses, which had become large sacs reaching by the side of the œsophagus and trachea, and betwixt the former and the vertebræ of the neck.

Here the mechanical operation of these sacs and their valvular openings into the pharynx, had even a more unfavourable effect than in the examples mentioned above; for whilst the food could not reach the stomach it fell into the sacs and increased the inflammation. In this case, the attempts to relieve were made too late, and the miserable patient died of irritation and inanition.

The cure in such cases might be conducted as hinted above, with the addition of opening the abscesses externally, so that no lodgment might be permitted in them. It must be admitted, however, that the difficulty and danger of the case is such as to make it very desirable to prevent abscesses from forming in communication with the throat, either by inflammation of the membrane producing them, or by suppurations bursting into the tube.

I cannot conclude this subject without leading the pupil to remark, that there is something in common to all the tubes of the body; in as far as irritation within them will produce abscess on their sides, and sometimes these abscesses will communicate with the tube affording an additional source of irritation and mischief. Thus from inflammation in the fauces we have abscess in the folds of the arches of the palate, and behind the amygdalæ; from inflammation of the pharynx we have abscess external to the bag. So have we abscesses around the larynx and in the thyroid gland, produced by irritation and inflammation in the

glottis. In inflammation of the urethra, produced by gonorrhœa, or the caustic, or the bougie, or injection, we have abscess also. So have we abscess from irritation in the rectum. Even external to the lacrymal passages we have abscesses, which, as in all the other instances, will turn to fistulæ, if attention be not paid to soothe the inflammation of the neighbouring canal. I shall enter more fully on this subject in treating of fistula in ano.

STRICTURE

OF THE

ŒSOPHAGUS,

Cured by the Application of Caustic.

William Hawkins, aged 40. This is a tall man, thin, but with a countenance which indicates health. He is a farmer: he says he has enjoyed uninterrupted good health until May last, when he was suddenly seized with a difficulty of swallowing. Before this he had not been subject to spasms, or eructation, or flatulence; nor does he acknowledge having had any of the usual symptoms of disordered stomach. He had not naturally a narrow swallow, nor had he before this time experienced any difficulty in swallowing his food.

Whilst sitting at supper eating his bread and cheese, the morsel stuck in his throat, a crust of bread was returned, and he could not take the rest of his meal. Next day he experienced the same difficulty of swallowing. He tried to take broth, but could get down only a very small quantity, and with much difficulty and exertion.

The obstruction in the throat has continued with very little variation until the present day, and he says, that he is now thin and weak from absolute want; for he has had no bad health nor trouble to reduce him. He does not suffer by sickness: he has no retchings so common in this complaint: he suffers no sense of suffocation nor distention of his stomach, nor borborygmus. The only complaint he makes, in addition to the difficulty of swallowing, is of slime or viscid matter, which collects in his throat, and which is discharged, when he returns the morsel which he cannot get down. He can swallow liquids, but any thing solid, as a crust of bread, comes back, working its way upwards without effort, that is, without volition or voluntary action of the muscles of the throat; but just before the morsel is returned, he feels a shivering through his frame. When the fingers are put around the throat while he swallows, there is neither bagging or distention of the pharynx to be felt, nor reiterated effort of the part. He thinks the obstruction is at the lower part of his neck.

He had, what he calls, sickening medicines

given him for this complaint before he came into the Hospital, but no instrument has been passed into his throat, although he has been getting worse, that is, experiencing more and more difficulty of swallowing since August last.

Thursday 3d. A bougie passed into the pharynx, and an obstruction met with behind the cricoid cartilage.

Evening. Since the bougie was passed he has found himself much relieved. He explains this by saying, that he eats with more comfort, and without any part of his food coming back.

Friday 4th. His difficulty of swallowing has returned.

Saturday 5th. The caustic bougie was employed; he suffered no pain; he says it produced a tingling sensation.

Evening. Immediately after the operation of the caustic, he thought he could swallow, but on making the trial the food returned. On after trials, however, and during the remaining part of the day he has been much better, and has not returned any of what he attempted to swallow.

Tuesday 8th. The food has not returned since

the application of the caustic. He says he never was better in his life.

Thursday 10*th*. The caustic again applied.

Sunday 13*th*. He has been quite well. He swallows his bread and tea with ease, and nothing is returned. He is very desirous of returning home, as he affirms that he is well, and his wife about to be confined.

While the patient feels no inconvenience, and is quite satisfied of his recovery, the bougie is still obstructed.—Dismissed.

This man remained well for a considerable time, and had no return of the stricture; but dying of some other disease, the surgeon in the country reported, that he could discover no marks of disease in the œsophagus.

I shall make no remarks upon this case, until I have put into your hands a pure specimen of the stricture of the œsophagus. By this I mean a case where the stricture was a consequence of inflammation, without the interference of the surgeon either to mar or to mend.

I am indebted for this specimen of disease to Mr. Goolden, of Maidenhead, a gentleman whose professional character bestows an additional value on what he communicates.

STRICTURE

OF THE

ŒSOPHAGUS FATAL.

Drusilla Champ, resident in the parish of Bray, Berks, ascribed the commencement of her complaint to a cold and sore throat, which attacked her twenty-four years ago. After this she had difficulty of swallowing, but it was not attended to till the inconvenience becoming more considerable, in the year 1792, four years after its first occurrence, she made application to a surgeon. But as a superficial examination afforded no evidence of disease, very little was directed for her. She had an acid gargle, and a volatile liniment to rub her neck. After this she did not apply for medical assistance. The disease gradually increased, she still experiencing more and more difficulty in swallowing solid food of any kind, at length liquids produced great distress.

For the last ten years of her life it required an effort of many hours to swallow a small teacupful of thin fluid. On the 29th of May last she died, evidently from starvation, occasioned by the impossibility of swallowing, even fluid nourishment, sufficient to support life.

Hearing of the case, Mr. Goolden requested the husband to allow him to examine the part; he

found [what you also have an opportunity of seeing], a stricture of the œsophagus, so narrow that it would admit no more than a horse-hair or bristle to pass; the stricture is situated at the lower part of the pharynx, and opposite to the cricoid cartilage. We cannot now be surprised that when Mr. Goolden put his finger into the pharynx, he could no where find a passage; it appeared a cul de sac. See plate IV. fig. 1. The preparation is in the collection, XIII. 2. M. 8.

OBSTRUCTION TO SWALLOWING,

FROM

Fungous Tumors of the Oesophagus, Fatal.

The following case refers to the preparation XIII. 2. M. 12. of my collection; I owe it to the kindness of Mr. Hamerton, apothecary of St. George's Hospital. Every one who visits Windmill Street must see how much I am indebted to the liberality of the surgeons of that Hospital. This case bears on the subject we are considering exactly in that degree, which makes it interesting, so like in symptoms to the cases of stricture, yet so different in reality.

John Terry, aged 70 years, was admitted into the hospital on the 22d of November, 1815. He

was unable to swallow either solids or fluids, and pointed to the cricoid cartilage as the part where the food stopped; and he complained of an uneasiness about his stomach, and suffered much from hunger. His tongue was foul, and his bowels constipated. He slept well, notwithstanding great weakness.

He said that he had been in health till within two months of his coming into the hospital. On a sudden, he found great difficulty in swallowing, and this without any previous pain or difficulty. This obstruction continued for three weeks, and only some days he could swallow thin gruel or beef tea. After this period he was enabled to take his food, and this power of swallowing returned as suddenly as the inability had come upon him. About ten days ago the difficulty of swallowing returned, and now he is again equally incapable of swallowing either solid or liquid food. He never felt pain in the throat. His suffering has been more from hunger than thirst; yet, of late, the craving has diminished.

At present what he attempts to swallow is returned by vomiting, after remaining in the throat a few seconds. He expectorates a white phlegm, which he complains is of a bitter taste. He has also within these few last days a pain and weight at the scrobiculus cordis.

An œsophagus bougie of a common size has been passed into the stomach, without any obstruction being felt.

About three weeks after his reception into the Hospital, he could swallow liquids without much difficulty; but he continued, notwithstanding, to sink until the 31st of January, when he died. Before his death, a large abscess had formed under the left arm, which contained a pint of pus.

Upon examining the body, the lungs were found generally adhering, but were otherwise sound. The heart was natural. Chalky matter was found within the coats of the aorta. The œsophagus was observed to be distended just where it entered the posterior mediastinum. It was of three times the natural size, and of a dark purplish hue. On opening it, a large irregular tumor presented, soft spongy and pendulous, from the inner coats of the tube.

The viscera of the abdomen were natural, with the exception of an appearance of inflammation on the peritoneum of the liver.

The preparation is engraved. Plate III.

REMARKS

UPON THE

Cases of difficult Deglutition.

In forming an opinion on these complaints in the pharynx and œsophagus, it is much to be desired that we should proceed only on matters demonstrated, and not trust to the feelings and ex-

pressions of the patients. The example of true stricture in the œsophagus, corrects the notion we should otherwise form. We see that inflammation will produce stricture, that the stricture will be progressively worse, because obstruction produces pain, pain inflammation, and inflammation increase of the stricture. So that here as elsewhere, a stricture necessarily gets worse and worse, until the canal is almost totally closed.

We perceive that in the stricture of the œsophagus, the derangement is in the inner membrane of the tube, that there is no apparent disease of the tunica vaginalis gulæ, nor any degree of thickening of the glandular structure of the œsophagus.

We owe our knowledge of this complaint to Sir Everard Home. He has given an engraving and description of it, and has described its exact place to be immediately behind the cricoid cartilage. To see it delineated, he observes, appears in some measure necessary to force upon the mind a belief, that the area of the œsophagus can be so much diminished, while there is so little thickening of the surrounding parts, and so very small an extent of the tube occupied by the disease.

It will be further observed, that in the engraving, which I have given, the stricture is not formed by a membranous partition, but by a general and somewhat irregular puckering of the whole membrane of the œsophagus. In the next place, we find no ulceration near the stricture, as in some

examples recorded. So that even in the very worst stricture possible, and where it is the cause of death, it does not necessarily follow, that ulceration shall take place.

The state of parts exhibited in the instance of Drusilla Champ, and the progress of the disease when left to itself, will prove the necessity of interference. And I may venture to suggest, that the proper course is the use of the bougie. But in the stricture of the œsophagus, as in the stricture of the urethra, cases will occur, where the attempt to dilate will bring on spasm and obstructions, and where the caustic becomes necessary; so that I am very sensible of the great benefit which the profession has derived from the example of Sir Everard Home.

We may observe, that in the case of Hawkins, both the simple bougie and the caustic bougie gave relief, when introduced into the œsophagus, and here again the analogy betwixt the urethra and the œsophagus recurs. The very satisfactory effect produced by the caustic, in the case of Hawkins, might lead us to prefer this mode of treatment; yet I confess that the very circumstance of the obstruction yielding so quickly to the means employed, appears to me a reason why the caustic, though happy in its effects, was not in this case necessary. And in similar affections of the throat, I would advise the pupils to be contented with the introduction of the bougie; and reserve the use of caustic for more formidable

cases, where the stricture is obstinate, and the disease of longer continuance.

From the specimens before us, as well as from the recollections of the natural structure, we shall be convinced of the propriety of introducing the œsophagus bougie with a gentle hand:—it requires dexterity, not force. The true stricture, which belongs to the inner membrane of the œsophagus only, is weak, and must be easily overcome. The circumstance of the natural thinness of the coats, the possibility of the instrument being engaged in a bag, or obstructed by a tumor, and not a contraction, should teach us to press lightly. But there is another cause of difficulty in the introduction of the bougie, proceeding from the natural form and connexions of the pharynx and œsophagus. This subject I propose to treat at large on another occasion, but I may notice it here as an additional reason for operating with precaution in the introduction of the bougie into the throat.

I believe that common inflammatory sore throat will sometimes, be the foundation of stricture in the œsophagus, and certainly inflammations of the tube, from violence done to it, will have this effect; for example:—

XIII. 2. M. 6. Is a specimen of stricture so remarkable, that I have engraved it in a plate. Twenty years before this woman's death, she swallowed soap lees. This produced inflammation, which terminated in stricture. She died literally starved.

XIII. 2. M. 7. Exhibits another stricture of the œsophagus, from the same cause. The child, in her mother's absence, swallowed soap lees, which produced inflammation, and stricture, and death, from total obstruction of swallowing.

It is singular that such a cause of injury to the tube should have occurred so often. A young woman was brought into the Middlesex Hospital, who had swallowed soap-lees; she died of mortification of the gullet.

The Subject continued, in Reference to Spasmodic Stricture of the Œsophagus.

There is a mistake, into which the most diligent are apt to fall, that is, apprehending the worst on all occasions, and mistaking symptomatic derangement for more formidable organic disease.

In swallowing, many muscles are called into co-operation, which are occasionally employed in other functions, or belong also to other combinations. It is in this manner that the muscles of the tongue or pharynx may become deranged individually, because of their relation to remote parts.

In fact, the pharynx and œsophagus much more frequently suffer from disordered action, which is appropriately enough called nervous, than from organic injury; and it is quite obvious, that the source of such symptoms, however formidable their appearance, is in the disorder of the stomach and bowels. When we have the dissection of the

nerves of the tongue, pharynx, œsophagus, and stomach, before us, and when we see distinctly these numerous connexions of nerves reaching in a complicated net-work from the abdomen to the tongue, we then receive the true impression of the prevailing nature of these disorders.

The succession of actions necessary to deglutition are these: 1. The retraction of the tongue and the rising of the larynx. 2. The distention and contraction of the pharynx. 3. The successive contractions of the œsophagus. 4. The yielding of the passage of the diaphragm and simultaneous relaxation of the cardiac orifice of the stomach. Spasmodic difficulty of swallowing, for the most part, takes place at the termination of the lower constrictor pharyngis, or at the termination of the tube in the stomach. From which it would appear that the derangement consists in the one set of muscular fibres refusing to enter upon the succession of actions, which should be propagated from the other.

There are two diseased actions which may be mistaken for stricture or scirrhous ulcer of the passage, viz. spasms of the muscular coat and paralysis, for they equally prevent the passage of the morsel. These affections are transitory, and merely symptomatic. Their cause is in the stomach, or more remotely in the liver or uterine system. Thus in the youth of both sexes the disorder may be introduced with a spasmodic cough, attended with cold and weight in the pre-

cordia, darting pains, and convulsive fits. Or the patient has eruptions on the face, indicative of disorder in the stomach, with pain and weight there; or the catamenia are irregular, the pulse small, the feet cold with craving of the stomach, and constipation of the bowels.

Even in adult males we meet with spasmodic difficulty of deglutition, coming suddenly in the middle of a meal. The food is retained for some time with a painful distention of the tube, before it is permitted to pass into the stomach, or it is rejected by a kind of rumination.

When authors speak of a spasm continuing for days, or during months, they surely mistake the paralysis for the spasm of the tube. Thus the case of Mathews, in Dr. Monro's valuable work [on the Morbid Anatomy of the Gullet, Stomach, and Intestines] was a case of paralysis. I attended the process of her feeding, and saw the dissection; the tube had resumed its function previous to her death, and the appearances were quite natural.

The next consideration I shall offer is, that in obstruction of the œsophagus, from a cause permanent in its nature, there is always more or less attending spasm. Hence, in the case of Nichols, although the cause was permanent, the symptoms varied; so they did in the case of Terry. Therefore, in considering what is to prove beneficial in spasmodic difficulty of swallowing, we are preparing ourselves to alleviate the suffering, from causes in their nature incurable, or which are re-

moveable by operation only. The remedies are either such as tend to correct the visceral disorder, and give activity to the gastric and hepatic organs, or they are more directly anti-spasmodic, by having an influence on the muscular action of the tube. 1. Mercurial friction on the neck. 2. Mercurial pill to the extent of salivation. 3. Valerian in draughts, and volatile anti-spasmodic liniments. 4. Stimulating vapors, as of assafœtida inhaled. 5. Laudanum taken in small quantities, so as to rest in the œsophagus; anodyne clysters, &c. &c.

FOURTH REPORT.

CASES

OF

FISTULA IN PERINEO.

I HAVE divided these cases into three series:

I. Sudden bursting of the urethra, and extravasation of urine.

II. Urinary abscesses of the perineum.

III. Fistula in perineo, properly so called.

The first six cases prove the alarming nature of this sudden bursting of the urethra, and extravasation of the urine into the cellular membrane;

the necessity of giving the urine immediate issue and of preventing the recurrence of the evil; of soothing the local irritation, and supporting the system against the influence of the extensive mortification which ensues from the infiltration of the urine. In the detail of these cases some useful distinctions will be observed.

BURSTING OF THE URETHRA,

AND

Sloughing of the Scrotum.

THE PATIENT SAVED.

Robert Cole, twenty-eight years of age, *Sept. 6th.* Clayton's Ward. This patient has long been subject to stricture in the urethra. He says that he never had an instrument passed, except on one occasion, a bougie. The disease has made this progress without his attaching blame to any body. He has no idea that he has fallen into his present condition from obstruction to his urine, and attributes all his suffering to cold and ague.

About three weeks ago he was seized with this ague and fever, as he describes it. "He dropt down for dead, and when he recovered his senses, he was shivering violently;" for this his friends recommended warm brandy and bark, and he believes they induced him to drink a full pint. And he adds, "there was the mischief, for after the

shivering I was in a flaming fire." The hot fit lasted for about three hours, then for some hours he had an interval of ease, after which the shivering recommenced.

During all this time he could not pass a drop of urine, and the obstruction continued until he was on his way to town in the Ramsgate Hoy, and this was altogether for a period of six days. While in the boat he felt as if he could make water, but he saw none come away, and after this the parts became enormously swelled, so that his scrotum was as large as his head, and much inflamed. It was when on the river that the scrotum became black, after which the urine dribbled away continually. He got a hackney-coach, and came directly to the Hospital.

The scrotum is much distended, and from the flaccidity of the skin, it would appear that it must have been still more swelled, and has somewhat subsided. It is quite black, and must all slough away. At the lower part of the scrotum the black slough already shows a disposition to separate. On the point of the right hip there is an abscess, which gives him more pain than the scrotum; it is pointing. The urine comes in drops through the natural passage.

The countenance is haggard, and he looks much older than he says he is. There is an anxiety, with something of wildness in his countenance. Yet he is perfectly collected, and gives me the account of his sufferings rationally. His pulse is

frequent and weak, conveying a creeping wiry sensation to the finger.

A sharp bistoury has been introduced into the lower part of the scrotum, so as to cut the slough and cellular texture; urine issued. A fomentation cloth is applied after being dipped in decoction of poppies, and sprinkled with camphorated spirits. An enema with starch and laudanum has been given.

10*th*. The process of sloughing is going forward; a large portion of dead cellular membrane has been cut away to give free vent to the urine and matter. The abscess of the hip has been lanced; no urine escaped from that abscess. He is very low, and fears are entertained that his constitution will not stand the shock and the continued irritations.

℞. Cinchon. Pulv. ℥ vi.
Rad. Serpent. Virg. ʒ vi.
Coque in aq. fontis oct: i. ad ℥ xii.
Liquoris collati ʒ x. Tinct. Cinchonæ comp. ʒ ii. et adde Tincturæ Opii gutt. x. f: h: et repetatur ter in die.

15*th*. This man's countenance is better; his pulse is firmer, the oppressive feelings at his breast have left him. The right testicle is uncovered; a mass of slough still encumbers the left; the lower part of the penis is bare, and the integuments of the pubes are undermined. Much sloughy cellular membrane has been withdrawn from under them. The penis is inflamed and tumid.

25th. The scrotum has entirely sloughed away and left both testicles bare. They preserve their vaginal coats.

26th. The right testicle is more retired, and consequently more covered. A spongy tumor of the tunica vaginalis already shews itself, which is destined to form the regenerated scrotum. The patient bears up well, with the assistance of wine and his bark decoctions.

27th. He is not so well to-day; he says, he feels faint and giddy; the pulse is weaker; the surface is cold, and his bowels are relaxed. Capiat haustum salinum et spiritis ætheris vitriolici comp. gutt. xxx. This derangement was owing to an accumulation in his bowels, and was removed.

After this the case book is defective. When the parts had put on a disposition to granulate and heal, and no irritability of parts or of constitution remained, the attention was more particularly directed to remove the obstruction of the urethra. The testicles granulated and covered themselves; the wound contracted from day to day, and the patient was discharged well.

BURSTING OF THE URETHRA,

SLOUGHING OF THE SCROTUM,

EXTENSIVE SINUSES AROUND THE BELLY.

Patient saved.

Tuesday. A professional gentleman called upon me and expressed considerable uneasiness on ac-

count of an œdematous swelling of the fore skin and scrotum, which he had observed in one of his patients. On our way I inquired into the circumstances, and learned that the patient was fifty-five years of age, and had spent thirty years in India. On returning to London he had put himself under a surgeon of eminence, for the cure of strictures in the urethra, and afterwards submitted himself to this gentleman's care, who was at this time in course of dilating the stricture by the use of the bougie. On Sunday he had used a bougie of a middle size, and had passed it without violence into the bladder. No blood followed this introduction of the bougie, but during the night there occurred a very considerable hæmorrhage from the urethra. Next morning a swelling appeared, which was supposed to be extravasated blood, and the following day I was requested to attend. I found the patient lying on his sofa in a state of fever and tremor. He said he had shiverings in the night, and the fever now upon him had succeeded. I observed that the urine came away with difficulty, and required him to strain a great deal. It now only came in drops, although before the attack the stream had been free. The swelling which had occasioned apprehension was indeed very like œdema; but on the right side and upper part of the scrotum there was a tumor which pitted and evidently contained fluid. I had therefore no doubt that the appearances were owing to extravasated urine. A moderate sized gum catheter was

passed into the bladder. The parts were fomented, and after the bowels were opened he had an opiate. I requested to be sent for on the slightest change taking place.

Wednesday. I find a very serious change to have taken place. Having a sudden call to make urine, in his agitation and in drawing out the plug of the catheter, he withdrew the instrument itself and made water from the urethra. He expressed himself pleased with the large stream, but soon after he found the swelling of the scrotum materially increased. The scrotum has become generally and greatly distended. I immediately opened the scrotum with the abscess lancet very freely; there came full eight ounces of blood, and watery fluid drained away, so as to occasion a very great reduction of the swelling even while I remained with him. A catheter was introduced, and particular injunctions given. Dr. Babington being expected, I did not prescribe for him at that time.

Thursday. He is better; he has less heat, and the scrotum is diminished. A black spot is on the front of the scrotum. He has a draught with five drops of laudanum every two hours.

Friday. The scrotum is of a dark red colour, a blush of erysipelas extends to the bottom of the belly; the black spot is not larger, but a slough will take place there. The cellular membrane within the incision is white and dead; I have broken down the cellular membrane, to give free passage to the fluids. The pulse is calmer; there is

not the same degree of tremor, nor is the tongue so dry. He is ordered a draught of decoction of bark with a few drops of laudanum and diluted sulphuric acid. The fomentation to be extended to the belly.

Saturday. No moisture on the skin; tongue dry; pulse 90; more taciturn. Dr. Babington has approved of more support. A pint of port wine to be taken in small quantities in the course of the afternoon with soup and jellies.

Sunday. The slough is very extensive, and the testicles will be laid quite bare. I have dissected away a great quantity of the ragged cellular membrane with the forceps and scissars. The wound is dressed with pledgets of lint dipt in camphorated liniment, and the carrot poultice covering the scrotum. Fomentations are continued to the belly. His bowels are moved every morning by clysters.

January 3d, Wednesday. I have now no fear for my patient's life; P. 80; skin more moist; he has taken more nourishment, and the sloughs begin to separate from the edge of the suppurating skin. I fear the urethra may be included in the slough, and then the case will be lamentable.

5th. Friday. The putrid mass is very large. I dissected off a large portion to-day. The redness on the belly is gone; but a hardness and caking of the skin above the pubes and groin remains. A milky fluid exudes from the integuments; we have urged him to live better.

8th. Monday. The slough is separated and the

testicles entirely uncovered. Already granulations show themselves. The catheter has been twice withdrawn, and larger ones substituted. This has been an operation of some difficulty, from the length and fulness of the fore skin. But now that the slough can no longer confine the urine the catheter is withdrawn, and he makes urine through the urethra without moistening the dressings below; and the case being much simplified, I have taken my leave.

12*th. Friday.* The surgeon in attendance has again requested my opinion; a swelling has taken place round the lower part of the belly. Above each groin there is an abscess with surrounding hardness. As it is thought possible that the urine has again found its way into the cellular membrane, the catheter is introduced; the integuments of the penis are very much distended; the glans penis cannot be felt through them, and it is consequently difficult to introduce the catheter.—P. 115, skin dry; urine high coloured; no appetite.

Friday 19*th.* Since my last note a considerable change has taken place. The inflammation extends around the lower part of the belly, forming a band two-hands breadth in diameter. It has been kept low by cold applications, but a band of hardened integuments incircles the belly, passing from the pubes round both groins and over the alæ iliorum.

From this date to the 29th there is no note.

The abcesses above the groin became soft and ulcerated, while the integuments around were caked and hard. The fluid discharged, sunk through all the bed clothes and mattrass. I enlarged the opening, took away some sloughy cellular membrane, and gave vent to eight ounces of pus, thin and without smell. This I did several times, for as the cellular substance was washed down to the opening by the flow of matter, it choked the passage and confined the matter.

After the sloughs were discharged, the sores were dressed simply, and the sinuses had compresses laid along them, and supported by a flannel roller. The whole surfaces affected were fomented morning and evening, and every attention paid to support the patient's strength.

February 1. Another depot of matter has formed on the right side. The quantity of thin inodorous matter now flowing from under the integuments of the abdomen, is very great. He stood to-day while I examined him, and the matter poured in streams from the ulcers. I have great fears for his life. His pulse is quick, his hands dry; he has a great expectoration, and is very much reduced in strength. What is favorable, is that he has a resolute mind to obey his physician, and is not too much alarmed at parting with life; and that he takes his wine and bark, submits to have the lower bowels emptied by enema, and takes light nourishment.

10*th*. Called to-day, and finding the sinuses

sluggish, advised an injection of sulphate of zinc. The experiment to be made cautiously on one of the sinuses.

March 28th. One of the openings still discharges, and I find him still confined. The remaining integuments have drawn themselves about the testicles so as greatly to conceal the ravages which have taken place. He must be sent out of town to regain force of constitution for the filling up of the sinuses; they are become habitual.

April 20th. Being again called here, I find the sinuses still open, and running all round the belly to the loins. The matter has dropt down upon the scrotum on the right side, where there is redness and tumor. I have passed a seton from the opening on the left side of the belly to that above the left groin. I have opened the abscess on the right side of the scrotum, and have given a depending orifice to all the sinuses and ulcers around the right haunch. The sinuses were injected with solution of zinc, and a more perfect apparatus of compression used: he takes the Islandic moss, and milk diet.

23d. All the sinuses of the right side amended. The seton on the left side has caused some inflammation, and a purulent discharge with fœtor. I have withdrawn it, and bound down compresses on the tract of the sinus.

From this time the patient made rapid amendment. The sinuses closed, and he regained his wonted health.

REMARKS

ON THE

PRECEDING CASE.

The gentleman who attended this patient was naturally inquisitive to know how far all this mischief was to be attributed to the use of the bougie. The cause of this extravasation of blood and urine was not occasioned by the introduction of the bougie, but by erection in a certain state of stricture of the urethra. The occurrence is not singular. A young gentleman, who had a stricture torn after painful priapism, found the blood flowing from the urethra next morning; from the swelling of the parts he thought he must have an aneurism of the penis; it was the urine which, escaping from the urethra into the cellular texture, distended the integuments of the penis and scrotum.

I am now satisfied that there was no second occurrence of the extravasation of urine in this case, as suspected, (on the 5th of January). The urine on first escaping had produced an erisipelatous blush over the integuments of the lower part of the belly. This subsided: but the injurious effect of this urine upon the cellular membrane could not be remedied; it slowly inflamed and sloughed; and on the rising of this second inflammation the swelling assumed the appearance of further infiltration of urine.

Having mentioned this sudden bursting of the

urethra, it may occur to my readers to inquire how it is that the urine does not get into the cellular texture, when the urethra is torn by the use of the bougie. The difference is, that in the one case the membrane of the urethra is torn anterior to the stricture. The urine therefore comes upon it with a diminished stream, after passing through the stricture, and where it has a free passage forward. In the other case of rupture by erection the breach is behind the stricture (for there is ever the weakest part of the canal) and the urine flows direct into the breach of the membrane, while the stricture is impeding its progress forward.

There is still a more formidable rupture than this into the common cellular membrane, as the following example shows.

EXTRAVASATION OF URINE

INTO THE

CAVERNOUS BODY, FATAL.

The body of a man, about fifty, was brought into the dissecting-room. The penis was enormously distended, and black with gangrene, but no breach of surface had taken place. On dissecting the parts a stricture was discovered in the urethra, and a breach in the canal which led into the cavernous substance of the penis. The urine, instead of infiltrating into the common cellular membrane,

had got a passage into the cells of the penis; erection from this cause had taken place and mortification. Parts preserved XIV. 1. M. The model of the appearance which first presented is in the opposite cabinet.

BURSTING OF THE URETHRA,

WITH

Extravasation of Urine,

WHERE THE

SLOUGHING OF THE SCROTUM WAS PREVENTED.

I was requested to visit a domestic of a family of distinction. I found a man of fifty years of age and corpulent, under great apprehension from an obstruction of urine. He was cook, and had prepared a great dinner; had been much exposed to the fire, and had exerted himself to the utmost.

In this state of heat and excitement he had gone to make water, but found himself unable; and as he exerted himself to force the urine he felt a burning sensation, but no urine came. He had been subject to obstruction of urine from an old stricture; but preceding this sudden difficulty, the stream of water was of a tolerable size.

On examining the back part of the scrotum, I found it filling with urine; but the tumor had not

advanced generally into the loose texture of the scrotum. I sounded the urethra with a soft bougie, and ascertained the extent of the stricture. I judged it possible to introduce a small silver catheter into the bladder. I succeeded in this, and drew off some ounces of urine, and let the catheter remain, and thought it sufficient to open his bowels by a dose of castor oil. Next day I had reason to regret, that I had not punctured the scrotum, it was necessary to open it largely towards the perineum, for the swelling was diffusing itself.

This patient did well at that time, and no sloughing took place; after the pressing danger was over I used a bougie to enlarge the stricture, and the wound of the perineum gradually closed. But having a similar attack, as I understood, some time after while in the country, he died.

BURSTING OF THE URETHRA,

AND

Extravasation of Urine—Fatal.

In the early part of last winter I was requested to see a gentleman, who had unexpectedly observed his scrotum enormously distended, after an attack of strangury. I found an old acquaintance, who had been three years before under my care for stricture in the urethra, and who had left me abruptly. It was a very narrow and irritable stric-

ture, and I thought he had tired of my slow mode of proceeding, and gone to some more adventurous surgeon; but he had only got impatient to be married. I found him now a man upwards of fifty, corpulent, with a young wife and an infant.

He received me with a smiling face, and acknowledged how much he had disregarded my former advice. But his animation was artificial, he appeared like one struck with death. He was too active, and too hurried in his speech. The scrotum was distended to the utmost, the penis was sunk in it, and a tumor presented in the perineum. I did not attempt the introduction of an instrument, and only opened the back part of the scrotum with the sharp pointed bistoury, carrying the point towards the place of stricture, and dividing the fascia of the perineum. I ordered tepid anodyne fomentations to the perineum, the bowels to be opened with infusion of senna and salts, and an enema of starch and laudanum. I saw him two days after my first visit. The scrotum had not diminished in size, it was of a dark red colour, and the incision was sloughy. He was dozing, and had lost his recollection of me. The next day when Mr. Shaw saw him, the parts had sloughed extensively, and he was sinking.

After death there was found a stricture at the bulb of the urethra. Anterior to the stricture, the canal had many irregular bands. Posterior to the

stricture, the canal was dilated; and immediately behind the stricture there was found an ulcerated hole of an inch in diameter. What was remarkable, was an abscess, formed no doubt by irritation, in the cavernous body of the penis: and from the same cause an abscess had formed upon the outer covering of the prostate gland. See XIV. 1. M. 52.

BURSTING OF THE URETHRA,

Where repeated punctures were made,

BUT

INEFFECTUALLY, FROM BEING TOO SMALL AND SUPERFICIAL.

In the following case I was occasionally consulted:—

H. H. aged 60. He acknowledges that in the early part of his life he was often infected with gonorrhœa, and that on one occasion it continued for nine months. In 1783, he first experienced difficulty of making water, and he had a strangury for eighteen hours; and at that time ineffectual attempts were made to introduce bougies into the bladder. Since that time he has been subject to have bloody urine; and when he has found the urine suddenly stop, he would, by squeezing the penis, force out a small calculus.

On Sunday last, the 24th, (three days ago), the difficulty of passing urine increased; it came drib-

bling away in small quantities with much straining.

On Monday and *Tuesday*, the difficulty continued; during the afternoon of Tuesday, while straining very much, he felt, as it were, a yielding to his effort, attended with great but indescribable uneasiness. The penis and scrotum were suddenly distended, and he became greatly alarmed.

On Wednesday 27th, in the afternoon, the scrotum was punctured near the rapha, and fomentation cloths were applied. In the evening the swelling of the scrotum on that side appeared to be diminished; at this time vesications were observed on the penis. These were opened, and the scrotum again punctured in several places. At this time the integuments of the belly appeared distended.

On Thursday 28th. The scrotum was reduced in size, but the penis was black. The integuments of the penis were this day laid open, which gave freer vent to the urine. At this time, when the patient attempted to make water, he was sensible of the urine passing through the incisions. In the evening of this day his pulse was full, and he had frequent hiccough. The penis was diminished in size, but blacker.

Friday 29th. The gangrene is accomplished in all the scrotum and penis; the tongue is brown and dry; pulse 80. not so full: skin cool. He says he is drowsy. The hiccough has ceased.

During the *30th* and *31st*, he was becoming

worse, and complained of a heavy dull pain in his loins, and the lower part of his abdomen. He could make urine through the opening on the penis, yet, from the fulness of the abdomen, the bladder seemed distended.

On the 1*st* of the month, the pulse became fuller, and 88. The numbness of the loins and belly was increased; the belly distended, apparently with flatus; and there was an appearance of more effusion under the skin.

On the 2*d*, the tension diminished, and a slough hung out from the wound. The next day the countenance altered, the pulse fell to 77, and feeble; the urine passed off continually.

On the 4*th*, he rallied; pulse 83, and skin cool, and he felt himself better.

On the 6*th*, he fell very low, and the extremities became cold, attended with hiccough. He was convulsed during the night. The convulsions continued at intervals until the morning of the 8th, when he died.

In this case, as in the others, it was very difficult to get the patient to take any nourishment. On the appearance of mortification the camphorated spirit was applied under the fomentation cloths. Afterwards it was dressed with slips of lint dipt in the sp. terebinthinæ, and the sour poultice over the dressing. He had decoction of bark with wine three times a day, and afterwards his wine was changed for brandy in his gruel: his bowels were moved by the ol. ricini, and he had occasionally an anodyne.

It was not permitted to open the body, but the bladder was drawn out from the perineum. The bladder was dark coloured, and loaded with blood, as after inflammation. The muscular fibres were uncommonly strong, and the muscles of the ureters very large and distinct. The prostate gland was of a natural size, but the ducts or folicules of the gland were much enlarged, and small abscesses had formed on the outside of the gland in communication with these ducts. The urethra, from within four fingers breadth of the bladder was dilated, but there the probe passed out of the canal into the sloughy integuments; immediately anterior to this hole there was found a stricture of small extent, but firm as cartilage; and to appearance the canal at this place was actually stopped. The kidnies had the pelvis distended.

URINARY ABSCESS

CONFOUNDED WITH HERNIA,

AND THE

PATIENT LOST BY DELAY.

Tuesday, February 21*st.* A professional gentleman called upon me to beg that I should take under my care, a man whom he had just carried to the Hospital, and whom he described as being in eminent danger from strangulated hernia.

I found the man so ill as to be nearly incapable of giving me any information. I took this note.

He had a scrotal hernia on the right side, the integuments of the scrotum are much tumefied, and have a blush of redness. There is a swelling on the left side of the pubes, the nature of which would be doubtful, from its being in the seat of inguinal hernia, were I not able to trace it downwards to a connexion with a swelling in the perineum. Behind the scrotum there is a tumor which has burst, and in the hole there is a ragged slough of cellular membrane, I got a tolerable answer to questions put to a man whose eye was dead, whose features were sunk, and who was in a sort of drowsy apathy. He had not been troubled with complaint of the bowels, he had had regular evacuations, and there was no fulness of belly. He said that he had had no obstruction of urine, but not trusting him in this I used a bougie. I found a stricture very near the orifice, but forcing that I could pass a middle sized bougie into the bladder.

I introduced my bistoury, and enlarged the opening in the perineum, and fomentations were put to the scrotum and perineum, and an anodyne enema given.

Wednesday, 22*d*. This man is with difficulty roused. His breathing is affected, and nothing can save him. He has had a stool, but the nurse cannot assure me that he has passed urine. Eight ounces of urine have been drawn off by the catheter: the urine is purulent and very fœtid.—Let him have a few spoonfuls of brandy and water.

A blister is to be applied to the back of his head and neck. The fomentations to be continued, and the opiate enema repeated.

Evening of the same day. He is less sensible. There is subsultus. P. 120, not intermitting. His manner of breathing indicates that he is dying. He is dying of irritation from which the old man in the opposite bed was saved by timely incision.

While the wound in the perineum ought to be an incision and not a puncture with the lancet, care must be taken not to touch the substance of the penis or the larger branches of arteries. This patient lost eight ounces of blood from the incision, which certainly tended to weaken him.

The hernia gave a fine example of the anatomy of the sac and ring. There had been no mischief there. The cause of death was the shock and irritation from the obstruction in the urinary canal, and the sloughing of the cellular membrane. The preparation is marked, XIV. 1. M. 57.

The stricture is not narrow, the canal seems rather as if it had been compressed by the abscess. The abscess extends round the urethra, and betwixt the spongy body of the urethra and the cavernous body. It also passes far forward upon the penis, and backward towards the anus. It does not appear that the abscess communicated with the urethra.

It may be necessary to draw the attention of my younger readers to the chief circumstances of these cases.

1. It appears that punctures of the scrotum are insufficient even to empty the cellular texture of the extravasated urine, and quite unfit for preventing the urine taking the same course a second time. If the lancet be used, the shoulder must be moved, while the point is kept at rest, so as to make a large opening in the skin.

2. For the most part the urine bursts into the perineum, and is carried by the fascia of the perineum forward into the looser scrotum.* In this case the opening into the scrotum must be at the back part, and the point of the instrument directed backwards, so as to give issue to the urine as it escapes from the perineum.

3. But it will be seen here, that the extravasation takes place sometimes more anteriorly, and the *ædema* of the preputium is the first sign of the approaching danger. In all cases, therefore, it is proper to sound the urethra with a bougie [and this should be done in the gentlest manner] to ascertain the place of stricture, and that the puncture may be directed with reference to the spot from whence the urine issues from the urethra, and which is always behind the stricture.

4. The urine has a deadening effect on the cel-

* Turn to the observations of Mr. Abernethy. I say turn to them, for no surgeon should be without that valuable work.

lular membrane, when it is permitted to fill the integuments. When in a smaller quantity, and with diminished force, it produces a blush of erysipelas, which subsides and rises again in the form of more phlegmonous inflammation. This was particularly the case in two instances, and the fever and the hard swelling of the skin required cold and sedative applications.

5. In most of these cases, the yielding of the urethra was preceded by a state of much excitement and irritation. An ulceration of the urethra is a consequence of this irritation, and the membrane is thereby weakened. The push of urine bursts through this tender part, before there is consolidation of the surrounding parts, or before the cells of the common texture are glued together by the process of inflammation. Hence there is no limit to the flow of urine, and hence the dangerous nature of the accident: for the general powers of the system quickly sympathize with the death of the part and fall low, and there is a just apprehension of the patient sinking.

6. The circumstance of irritation preceding the rupture, teaches us to be particularly cautious either of exciting the urethra by interference with instruments, or of permitting a fever to be raised by imprudence on the part of the patient, in a certain state of stricture with irritation. I need not here repeat what may be the dreadful consequences. These cases make it too apparent.

This view of the subject enjoins another precau-

tion, that when the accident of bursting does take place, after giving free passage to the urine, it must be one of our principal objects to allay the irritation.

As it is probable, that in the prosecution of the work, I may have new opportunities of describing the effect of injuries to the perineum, I shall not here speak of the extravasation of the urine from the urethra when ruptured by external violence.

The Subject continued.—Cases of Urinary Abscess.

Under this head, we consider all those abscesses which are occasioned either by the irritation within, the urethra causing abscess external to it, or by the escape of urine through ulceration of the canal. For it will be remembered by the surgical student, that the urine does not always escape as in these examples just delivered, at once abroad into the cellular membrane. It will now appear, that sometimes it makes its way by little at a time, and by the irritation of its presence produces abscess.

While the surgeon is inattentive to the different ways in which the urinary abscess forms, he must be liable to produce them by his improper interference with the urethra; and I am inclined to think, that many have produced such abscesses while innocent of the knowledge that they were themselves the cause.

ABSCESSES OF THE PERINEUM

FROM

Stricture of the Urethra,

WHERE NO BREACH OF THE CANAL TOOK PLACE.

Abscess in the Perineum, produced by the Operation of the Bougie.

HOLDEN, 68 years of age.

1*st Day.* This old man is taken into the house, because he is in a very miserable and helpless condition from stricture in the urethra. He rises many times in the night to make water; he passes it in small quantity, and in a small stream. The wax on the end of a soft bougie is moulded to a very narrow stricture, and is brought out exhibiting a small projecting point.

3*d Day.* A fine bougie has been passed into the bladder.

4*th Day.* Complains of shivering and fever, and that he is very ill.

5*th Day.* Was relieved by an enema of starch and laudanum, with a sudorific powder. Says he is much better, and passes his urine more freely.

7*th Day.* A bougie was passed into the bladder and withdrawn after five minutes.

9*th Day.* Complains of irritation and burning in making water. There is a little hardness in the perineum. The bougie is not to be used again. He is ordered laxatives and tepid bathing of the

hips, and an anodyne draught with the aqua kali.

11*th Day*. The tumour of the perineum is considerably enlarged and hard.

At this time our interest in this man's situation was considerably increased. He formerly had a hernia, and wore a truss. The hernia came down, and could not be reduced: it became strangulated in three days, and was operated upon. He was in extreme danger, for a small portion of intestine came down under the Poupart ligament, and the delay of a night would have been fatal. The bleeding, the warm bath, the clysters, the continued vomiting, kept him sufficiently low to permit me to leave the abscess in the perineum and the stricture of the urethra to nature. The abscess broke, an extensive foul sloughy suppuration was established; a cataplasm was applied to the perineum, but nothing further was attempted. While the man was under discipline for the wound made in the operation for hernia, the abscess became clean, healthy, and closed, and not a drop of urine was discharged either at first or in the course of the cure.

When the wound had cicatrized, and the abscess had closed, I used the bougie again, but with great precaution; and this patient was dismissed perfectly well.

The particulars of this case will form part of another series. But at present it proves, (what I

wish were more generally known than I find it to be) that a very little pressure of a bougie more than is right, into a narrow stricture will bring on irritation in the canal; and that the effect of that irritation within the canal will be a suppuration or abscess on the outside of it. The cellular membrane is so much more prone to fall into suppuration than the part primarily affected, that matter is collected external to the urethra, and without any direct communication with that tube.

It will no doubt also be observed, that the circumstances of the case required rest and forbearance, and that the cause of irritation being removed, the abscess closed. If the bougie had been persevered in, urine would soon have appeared in the abscess; that is, the urethra would have become ulcerated, and then a fistula would have formed.

Another Example.—Stricture of the Orifice of the Urethra, producing Abscesses of the Pubes.

There is no kind of stricture which is attended with more distress and spasm, and the consequent irritation, than the very narrow stricture situate immediately within the orifice of the urethra. The first specimen of stricture of the urethra preserved in that division of my collection which contains the morbid appearances of the urinary organs, is of one just within the orifice of the urethra, and which with difficulty admits a bristle. In this case the effect of irritation in the canal was

to form a succession of abscesses around the root of the penis. There was no communication betwixt the urethra and these abscesses.

A Third Example.—Of Abscess from the Use of the Bougie.

At the breaking out of the war with the United States, I had under my care an American gentleman, who, in his desire to get home, used the bougie too frequently, and without allowing the excitement of the parts after the introduction of the instrument to subside, before he passed it again. In consequence of this I found him complaining of heat, throbbing and swelling, in the perineum; and on examination a hardness was perceptible in the perineum. This hardness increased, and was prolonged towards the anus. The skin caked; I could not resolve the swelling; it became red and suppurated. But the canal being sufficiently pervious, by making him live very low and quietly, by soothing the part, and by giving mucilaginous drinks, and deferring the use of the bougie, it closed and healed. I might give many other instances of the same occurrence, were it not against the plan of this work to refer to cases of which I have no longer any record, either in notes or in anatomical preparations.

A suppuration will take place at the inner corner of the eye, bearing the same relation to the lacrymal duct that these have to the urinary passage,

and without any communication with the duct itself, but proceeding from irritation there. If such an abscess be neglected, it may become true fistula lacrymalis; and then, like the fistula in perineo, it will, by the increasing excitement, support itself.

ABSCESS OF THE PERINEUM,

COMMUNICATING WITH THE URETHRA.

L. B. was proceeding with bougies to enlarge a stricture in the urethra at the bulb, and had succeeded so far that he could pass a bougie of the size of a writing quill, instead of the smallest with which he began. He was about to leave town when he had an attack of shivering and feverishness; and at the same time he felt a hard and painful spot deep in the perineum. When he explained his situation to me, I advised him not to undertake his journey, but to remain very quiet and to live low; to apply leeches to the perineum, to foment the perineum, and to take a dose of salts.

He returned to me with the swelling hard and prominent, complaining of a burning sensation when he made urine, and that after making it there was spasm and drawing of the part attended with great pain. This he said subsided until called again to make water, when the symptoms returned.

I had no doubt that the urine had got from the urethra into the abscess, and that it was exciting it to unusual inflammation. I therefore introduced the

gum catheter, and let it remain in the bladder; by this the urine was drawn off without falling into the abscess, and he was easy for two or three days.

On visiting him at the end of this time I found him complaining, as formerly, of pains and contractions, and a burning sensation when the urine passed. This was explained by discovering that the urine passed by the side of the catheter as well as through it. Upon withdrawing this catheter, and introducing one a size larger, this symptom disappeared. The swelling subsided, the inflammation and pain in the perineum was removed, and he appeared quite well, having the additional satisfaction of seeing an unusually large instrument pass easily into his bladder.

About three weeks after this, having made preparations for his journey, and having dined with a friend in a coffee room to be ready for the mail, he rose to make water, and suddenly he felt his old symptom, an acute burning pain in the perineum. He was aware of what had taken place, and returned to his lodgings, and sent for me.

We repeated the means formerly employed, but without all the same good effect; an abscess formed,which burst and discharged a few drops of urine, and became a fistula. By the use of the gum catheter, and afterwards by the use of the bougie occasionally, this fistulous abscess diminished and closed; and at length the patient got into the country.

STRICTURE,

WITH

Abscess in the Perineum.

THE PATIENT IN THE FIRST INSTANCE SAVED; BUT ON A RETURN WORN OUT WITH IRRITATION.

—— *Pool*, a servant of Sir J. St. A. aged 50, has been taken into the Hospital. I attended him formerly in the following circumstances.

He had been subject to strictures in the urethra for many years, and by the kindness of his master he had been placed under the care of more than one surgeon; the caustic had been applied several times. The occasion of my seeing him was this. In coming up from Brighton he was exposed to fatigue and cold, and hence came a frequent call to make water and a great difficulty in passing it, which was followed by a complete strangury. He told me he had been subject to ague, and that this attack had been preceded with cold shivering.

One o'clock. There is a tumor in the perineum, and a little oozing of matter from the urethra; his pulse is full and strong, the belly is distended, and the bladder can be felt above the pubes. I introduced the smallest bougie into the stricture, but it did not reach the bladder; while I withdrew it, I urged him to try again to make water. He was enabled to pass eight ounces of urine. Leeches were then applied to the perineum, after which he was ordered into the hip bath.

Eight o'clock in the evening. He is not only feverish, but is excessively anxious and perturbed in his mind, and his countenance declares his long suffering. It is a state which must not be long permitted to continue. He has been in great pain, and the bladder is felt above the pubes. He has not passed urine since my visit. He experiences a burning sensation in the tumor of the perineum, and the scrotum is slightly swollen, I suspect with urine. A purging draught has had no effect on the bladder, and an opiate clyster has given him no relief. Contemplating these circumstances there was but one thing to be done. I introduced a metallic bougie down to the stricture. I then took a sharp and narrow bistoury, and passing it into the base of the tumor I directed its point towards the end of the bougie. I then drew the bistoury so as to lay open the tumor—a quantity of fœtid pus burst out to some distance on introducing the bistoury, and by-and-bye the urine dropt freely through the incision. This so effectually relieved the urethra of pressure, that the patient was in a short time able to pass a few ounces of urine by the natural passage.

On the succeeding day the belly was soft; the bladder was still to be felt, but the feverishness had diminished. I was prepared to puncture the bladder, if this amendment had not been evident. He escaped on this occasion; the swelling subsided; the urine became more free, and only a small fistulous opening remained in the perineum,

from which two or three drops of urine came when he made water.

On examining this man's stricture, I found it to be of the most obstinate kind; admitting only the end of the smallest bougie; of a cartilaginous firmness, being continued some way along the canal, and very irregular. For the cure of this stricture he was under the care of a surgeon for twelve months, with some amendment. But the bougie was never passed into the bladder; he was subject to smart feverish attacks, with aggravation of pain, and difficulty of making water, and on these occasions he was also liable to an inflammation of his chest.

This man being received into the Hospital, I find him much exhausted, as it were older by some years. He is now suffering under one of his attacks, which belongs, at the same time, to the urinary organs and the lungs. In receiving him, my object is to enlarge the fistulous opening in the perineum, and to get an instrument into the bladder from the perineum.

The attack being somewhat subdued by the warm bath, ipecacuanha joined with opiates and diluent mucilaginous drinks, I thought of gradually enlarging the opening in the perineum by introducing a bougie into it: by this I intended to give more vent to the urine, and thereby to relieve the continued excitement of the bladder. This attempt being continued for some days very gently, there came on alarming symptoms, with a crystal-

line tumefaction of the prepuce, and a hardness of the scrotum at its connexion with the side of the penis. I thought it necessary, however unwilling, to touch this patient with the knife, to relieve the canal more effectually.

I introduced a grooved staff into the urethra down to the stricture. I then took a sharp and narrow bistoury, and introduced the point of it into the opening in the perineum, I carried it forward until it grated on the groove of the staff, then moving the handle of the instrument, while the point rested on the staff, I effectually opened the urethra.

Next day the tumefaction was abated, and the patient passed urine freely, both by the wound and the urethra. For some time after this, I satisfied myself with giving him a saline mixture, with Dover's powder and the tepid bath, by which the fever and the dryness of his skin was again abated. But I find in my note of the case, "time slips away, and no amendment of this man's condition." So I endeavoured to make good the passage, and close the wound.

After the incision the wound was dressed with a pledget of lint and a poultice, by which it was kept open, so that in my future operations I might have no further use for the knife. Having made him retain his urine, I prepared to pass an elastic catheter into the bladder. The stream had a direct issue from the bladder by the wound. I had little difficulty in introducing a gum catheter from the

wound into the bladder. I gave him liberty to withdraw the instrument whenever it hurt him, or if the urine did not come freely; the urine came freely through it, but was offensive and dark coloured.

The condition of this man induced me to wait for the favourable moment, and what I did was quickly performed, and without exposing him to suffer either much or long; but his situation did not improve. He was subject to cold shivering, he had great pain in his right side, his breathing was much affected.

The report was still to the same purport—" He breathes with difficulty; he has pain in the right side, which cuts him in drawing his breath; his face is flushed; his pulse quick. There is, at the same time, a dulness and indifference about him, and he is inclined to dose."

After a consultation he was bled, and a blister applied to his breast. Next day he was more oppressed, and although his friends, who visited him, said he had often been as ill, it was evident to me that he would die. "He passes his urine freely; and attention has been paid to allay any irritation which may be upon the bladder; but it is to no purpose, his breathing is quick, and his eye turbid." Died the morning after the report.

Inflammation was found in the right side of the chest, and the lower lobe of the lungs adhered to the diaphragm, by means of a layer of coagulable

lymph, foul with purulency. The lungs were dark with inflammation. The liver and all the abdominal viscera were sound. The stricture in the urethra was very narrow. The passage from the bladder to the wound of the perineum was free. The inner surface of the bladder was rough, in consequence of repeated attacks of inflammation, and studded with irregular projections, formed by coagulable lymph *. Parts preserved. XIV. 1. M. 56.

A SIMILAR CASE TO THE LAST,

ATTENDED WITH REMARKABLE DESTRUCTION OF THE URETHRA.

— *Maxwell*, 55 years of age, Clayton Ward, *5th February*, 1815. This man has been long subject to strictures in the urethra. He is deaf, and particularly stupid, but the appearances speak for themselves. There is an orifice in the scrotum discharging urine and pus; a discharge flows from the urethra. There is a large tense swelling in the perineum.

I introduced a sound into the urethra down to the stricture, which was near the bulb of the urethra. I then struck a double-edged scalpel into the prominence of the tumor, in a direction towards

* In a future part of this work, the affection of the chest, as connected with local diseases, and the irritation from surgical operations, will be treated of, and illustrated with cases.

the point of the sound. Urine and pus started out with force from the puncture. I drew the knife backward, so as to make an incision, into which I could introduce my finger, and feel the end of the staff. I ordered him an enema of starch and laudanum. He passed the night in great comfort and free of pain.

6*th*. I now had a more intelligible account from the patient. Caustic had been applied to his stricture, and the bougie afterwards used. He was relieved, but not cured; and for some time made water pretty freely, but always with a burning sensation in the urethra. The pain became more and more, attended with scalding, whenever the urine reached the part of the urethra where the caustic had been applied. The tumor rose very gradually, and was soft the day before it was opened.

9*th*. Passed a small silver catheter into the bladder.

10*th*. Catheter withdrawn in the night, because it gave him pain.

15*th*. Passing urine freely by the urethra, and some part by the wound.

21*st*. The dresser has been dilating the stricture by the use of the bougies. The passage is enlarged, and he is wonderfully contented.

March 7th. They are neglecting this man. I find the passage narrower; the urine comes altogether by the wound, and a small bougie passes with difficulty through the stricture.

9*th*. I experienced great difficulty in attempting to pass a small silver catheter into the bladder, and desisted; taking then a large soft bougie, to ascertain the state of the canal, I found it, unexpectedly, and without using force, pass out at the wound.

11*th*. A catheter has been passed into the bladder.

25*th*. The catheter has been retained till this day; the urine came freely through it, and also by the side of it. No urine has come by the wound, and the swelling and redness of the perineum is rapidly diminishing. A larger catheter introduced.

27*th*. The scrotum is large, but this comes from a swelling of the testicle, not from extravasation nor inflammation of the perineum.

April 10*th*. The passage was made perfectly free by the use of the silver catheter, for catheters successively of a larger size were introduced; but his health did not improve. His evening fever continued, his pulse was always quick, he had no appetite. He had a cough, with purulent expectoration. He was wasting. A natural question occurred—Could the presence of the instrument occasion or assist in keeping up the irritation? Accordingly, for some days, the catheter has been withdrawn, and only a soft bougie passed into the bladder, very gently, twice a week. But the symptoms have not mended.

20*th*. Every attention has been paid to soothe and cherish him; the urethra has not been touched. His hectic increases; his pulmonary complaints increase. He is much in the same state with the patient in the same ward, whose death is certain, but of whom it is difficult to say whether he sinks from fistula in ano or phthysis.

His voice became husky and low; he died on the 2d of May.

What was remarkable here, as the preparation exhibits, XIV. 1. M. 54. was a deficiency of the urethra: there was a great vacuity from the orifice of the bladder, to within five inches of the glans. A process of ulceration and absorption had entirely carried away the urethra.

From this and some other examples that have fallen under my notice, I have held out a caution to the pupils, against exciting or keeping up a degree of irritation by the continuance of instruments in the urethra; for in certain constitutions [I believe scrofulous], such an absorption of the canal may take place, as must render the cure quite impossible.

CASE OF FISTULA IN PERINEO,

OF TWENTY YEARS STANDING,

WITH REMARKABLE DISORDER IN THE PERINEUM.

William Huggens, a sailor, aged 45. Clayton's Ward. *Oct. 22d*, 1814. It appears that he has had gonorrhea several times in his life; that

about twenty years ago, he had discharge from the urethra, attended with phymosis, so troublesome, that it was necessary to divide the foreskin. For some years after this, he describes himself to have been in health, but he was at sea, and lived a sailor's life for four years. About this time he became subject to obstruction in the urethra, and the difficulty was so great, that he would continue to make ineffectual efforts for twenty-four hours together, before he could pass a drop of urine. For four years he was subject to this distress. It was at this time that he fell from the ship's side, and received a violent contusion of his loins, on account of which he was carried to the hospital ship at Sheerness. Here, experiencing some of his old symptoms, with obstruction of urine, the surgeon attending was led to examine his urethra with a bougie. But he never succeeded in passing the instrument into the bladder. Notwithstanding this, the patient experienced considerable relief, and made water more freely. He was discharged from the hospital ship, but ever after attributed the discharge from the urethra to the operations he underwent while there.

About ten years ago he was taken prisoner, and remained in Valenciennes until the peace. Three years after his confinement he experienced an increasing difficulty in making water, and had more frequent calls. He was attacked with fever, ushered in with cold shivering, and followed by inflammation and swelling in the perineum.

Hence came still more obstruction to the flow of urine, and a severe scalding pain as it passed. This was attended with a thick discharge from the urethra. A hard tumor now formed in the perineum, which they attempted to bring to suppuration by poulticing; but no opening was formed at that time: the pain, irritation, and inflammation subsided, but the tumor in the perineum continued.

Two years after he experienced another attack. It was ushered in as formerly by rigors and fever; and now an abscess formed more forward in the perineum than the last. It opened and discharged matter. After this he discharged his urine, in part through the urethra, in part by this fistulous opening in the perineum.

It was three years after the formation of this fistula that another formed. There was again the cold shivering and fever, unusual difficulty of making water, and burning in the passage, followed by a new suppurating tumor, which burst in the perineum. On examining the parts, with a view to understand these successive abscesses, this last appears to have formed in the scrotum.

He remained in this distressing state for several years, passing urine at the same time through the penis scrotum and perineum. While in prison in France, little had been attempted for his relief; at one time he was attended by an English surgeon, from whom he expected a cure, but a misunderstanding arose betwixt the French and English

surgeon, by which he was deprived of the latter's assistance. Last June he returned home.

This is his present condition. Five inches from the extremity of the penis there is a firm stricture in the urethra. The scrotum is large and irregular, from successive inflammations. There is a fistulous opening on the lower part of the scrotum, through which the urine drops. The perineum exhibits a singular appearance; it is irregular and tuberculated, and as firm as a board. One tumor more considerable in size hangs pendulous; it is of the form of a pear, and hard as stone. The whole space is undermined with fistulous communications. The hole through which he has long discharged the greater part of his urine is at present closed.

This patient was kept three weeks under repeated attempts to pass the finest bougie into the stricture in the urethra, the common bougie, the catgut bougie, and the silver sound were ineffectually tried to make a lodgment in the contracted urethra. But the canal at the part had partaken of the hardness and irregularity of the perineum, and successive extravasations of urine, and the consequent inflammations had consolidated the surrounding parts to such a degree, that there was not a probability of introducing an instrument. From the extent of the solid portion of the urethra, and its irregularity, the use of the caustic was, in my opinion, out of the question. Accordingly, after three weeks experience of the patient's constitution, and a full

examination of the great extent of parts destroyed, I planned the following

OPERATION.

The urine to be retained. If possible, ascertain the situation of the testicles in the mass of diseased scrotum, and make an assistant push them up to the groin, out of the way of the knife. Pass a sound down to the stricture, and let it be held steady by the same assistant. Pass the common probe into the sinuses in the perineum.

Begin the operation by following the principal sinus with the scalpel. Dissect back the mass of parts so as to expose the spongy body of the urethra. Next open the urethra so as to expose the end of the sound, which is in the urethra. Having opened the urethra anterior to the stricture, endeavour to find the passage backward, through the stricture, with a fine probe: Cut upon that probe so as to make way for the point of the catheter, that it may be passed into the bladder, and there retained.

Nov. 12th. Such were my anticipations of the operation, as stated to the pupils; very different was the operation in effect.

1. As to dissecting the bulb of the urethra it was impossible; it could not be distinguished. The mass cut into was firm and dense, as a scirrhous tumor, and thus what actually fell under the edge of a sharp knife was cut, but there was no

possibility of using the knife as in dissection, to lay bare a surface.

2. In cutting into the urethra, anterior to the scrotum, I found myself much incommoded by the great size and firmness of the scrotum. Although it was possible to arrive at the catheter, and expose it, by digging into the firm substance of the scrotum, yet when I came to use the probe and to point it backwards into the stricture, it was impossible to give it the direction. Though the probe could be directed forwards to the penis, it could not be directed backwards to the bladder, because the large unyielding scrotum overhung the opening.

3. Knowing the bad consequences of keeping a patient too long upon the table, who is worn down by much suffering, and that peculiar influence which disease in those parts has upon the constitution, I found it necessary to be decisive. I therefore cut out a portion of the callous urethra, and opened the sinuses which run backwards.

4. Having now cleared the parts, I wished the patient to make water; but I found he had been told to strain hard, to pass every drop of urine before coming into the theatre. This was a disappointment, in so far as it became necessary to finish the operation by introducing a portion of bougie into that hole which appeared most like the urethra, and to send him to bed.

In the evening of the same day, I took off the dressings, and made him pass his urine; it came in full stream from under the pubes, and without

any difficulty or delay I passed a full sized hollow bougie into his bladder. I drew off a great quantity of urine, and such a sight the patient declared he had not seen for ten years. I now passed the silver catheter into the extremity of the urethra, and brought it out at the wound. I then directed it into the hole from whence the urine had been discharged, and passed it home into the bladder.

After Treatment.

The appearance of the wound in the perineum was not promising; it was of great extent, and very irregular, so that six days after the operation I found it necessary to cut across a firm band of condensed cellular membrane to admit the catheter to lie deep enough. The patient, in the mean time, did well, was of good heart, and very much pleased to see his stream of urine come at a call. The wound was dressed simply with slips of lint dipped in oil, and a poultice over them. He was kept on very low diet; had an opiate at night, and decoction of althea for drink.

December 1*st*. The house surgeon, finding that the silver catheter produced pain, and did not give free passage to the urine, withdrew it. The holes of the instrument were filled up with mucus, so that it required the patient to strain, in order to pass the urine; this, with the presence of the instrument in the bladder, irritated the bladder, and

occasioned a mucous sediment in the urine; an elastic gum catheter was introduced.

3*d*. He makes water so freely through the elastic gum catheter, and the wound has closed to such a degree, and so hides the instrument, that I am inclined to let it remain.

5*th*. He has been in pain from the wound being dressed with blistering ointment; return to the simple dressings, and the cold application to the scrotum until the tumefaction and redness shall have subsided.

10*th*. The tumor, which was pendulous, from the perineum, contracts; the irregularity and hardness of the integuments diminish. He retains his urine sufficiently long, and voids it freely. But the wound diminishes very slowly, and an unkindly exudation covers the surface of the granulations. More generous diet allowed.

12*th*. To-day a large silver catheter was substituted for the gum catheter. The gum was much dissolved by the urine, a shell of concretion had formed on the end of the catheter, and the tube was much stuffed with mucus.

16*th*. The tumefaction of the scrotum has subsided. The pendulous tumor has wasted almost entirely, and the depth of the wound is remarkably diminished. The surface of the sore is red and healthy. I can still touch the catheter with the probe, although it is hid in the granulations.

19*th*. The instrument being in the bladder,

produces some irritation; but every thing is favourable.

26th. The catheter withdrawn, it was black, but has no crust upon it: it is cleaned and replaced.

January 10th. I can touch the catheter with the probe: the wound is dressed with the blistering ointment, and a warm poultice over it. It wants activity.

20th. The sore contracts, but the granulations are not inclined to close. Lime water and tincture of cantharides injected; the sore dressed with the digestive ointment, mixed with red precipitate.

February 10th. Let all irritating means be omitted. Foment at night, and use the bread poultice to the perineum.

March 5th. The catheter to be withdrawn, and only the bougie passed every morning. This was done, from the conviction that the presence of the instrument excited the discharge, and that this discharge kept open the wound. It is hoped, that the passage being clear, and no source of irritation remaining, the small hole which remains may close. To-day I had an opportunity of seeing him make water, which he does in full stream, but a considerable portion comes by the perineum.

From this time forward various attempts were made to close a small hole which remained in the perineum, but without success. The gum catheter was left for some weeks without a change being effected; the largest sized silver catheter was left in for a very long time. The occasional

use of the catheter was tried, by which the urine was drawn off twice a day. Hot and stimulating dressings with poultice were employed: mild dressings and poultices were in vain substituted: stimulating injections of tincture of cantharides and solutions of sulphate of zinc, were thrown in: hot oil of turpentine was used to touch the fistulous opening: the edges were touched with a red hot wire. A seton was drawn across the opening. By these means, and many more contrivances, the opening was not diminished of that diameter which it had spontaneously assumed. It was remarkable, that I had at this time under my care three other cases of fistula in perineo, in one of which, there had been loss of substance; in the two others, there had been much disease, but no loss of substance. In the case where there had been loss of substance, I experienced the same difficulty as in this case of Huggens; in the others, the fistulous opening and sinuses closed by merely keeping the urethra pervious.

For some time this man had been more diverted than interested in attempts to perfect the cure. He was quite well. He had recovered his health, and was no longer subject to cold fits or fever. He did not suffer the least irritation of bladder, and it had so entirely recovered its dilatability and right tone, that he was never disturbed at night. The perineum had become soft and natural, in a degree not to be expected by those who had seen it a few months before: irregular with

knobs, and pendulous tumors of long standing, and of a stony hardness; by placing his little finger on the perineum he could make a full stream of urine by the natural passage, without a drop coming by the small hole which remained. In this state he was dismissed.

This case will illustrate many points important in practice; but I confess that it left on my mind this reflection, that in no instance is it necessary or proper to cut the smallest portion out of the urethra or perineum; and that the difficulty of closing the breach of the canal is principally to be attributed to the portion cut out in the operation.

This subject will be resumed.

END OF PART I.

Surgical Observations,

&c. &c.

THE number and endless variety of "accidents" received into the Middlesex Hospital, give me daily opportunities of witnessing the house surgeon and dressers occupied in setting fractures, and the difficulties which they experience at first entering on the practice of their profession. And even under the vigilant superintendance of experienced surgeons, fractures sometimes go wrong, and exhibit on the patient rising to walk, or using his arm, awkward demonstration of the principles which ought to have directed us. I mean occasionally to revert to this subject, and to take notice of some of the lesser cases: but fractures of the bones of the chest form a subject of far greater interest, as they implicate parts of vital importance.

Strange as it may appear, this is a subject which notwithstanding the activity of the members of the profession, has been much neglected; and I am sure that those for whom these cases are chiefly intended have no means of knowing the true principles of practice, since the books which are in their hands neither represent the facts nor the practice correctly.

FIFTH REPORT.

CONTAINING CASES OF FRACTURE, DISLOCATION OF THE SPINE, AND INJURY OF THE SPINAL MARROW—OF EMPHYSEMA, AND OF CARIES, FROM FRACTURED RIBS.

FRACTURE of the Spine is the most formidable injury to which we are liable, without the immediate extinction of life. It may not perhaps appear to be very useful to present melancholy examples of this truth; but the fracture of the spine, great as the injury is, still affords some hope of cure, and that hope may be increased by proper treatment. There are, besides, some vague unsettled notions which prevail on this subject, and which demand examination.

CASE OF FRACTURE OF THE SPINE, FATAL.

Sept. 12*th*, 1816.—*Auton*, 25 years of age, a plasterer. This young man fell from a height of forty feet, and in his descent his back struck against the corner of a stone stair about eighteen feet from the ground. When brought to the hospital, a swelling was to be felt over the lower dorsal vertebræ. On pressing the finger deep, a depression, or interval, betwixt the spinous processes could be distinguished. He complained of great pain in the part, and all over the abdomen. He breathed

naturally, and was perfectly sensible: there was no defect of motion or of feeling in the lower extremities.

He was bled to sixteen ounces: twelve leeches were applied to his back; and he had a dose of the house physic.

13*th*. He has passed a restless night. He is in great pain; he vomits every thing he takes; the purgative mixture was rejected, and he has had no relief in his bowels. An enema ordered.

14*th*. He is delirious. His pulse frequent, not full; his skin hot. He passes his fæces and urine involuntarily: but there is no flaccidity of the abdominal muscles, and he has the perfect use of his limbs.

15*th*. This young man's condition is very threatening; his pulse is 136. He was delirious during the night, and threw himself out of bed. He is now in a state of extraordinary excitement, and although he has full motion of the limbs, yet the spine is undoubtedly broken, or crushed, and he will, I fear, die with the symptoms of the last case, and from the same cause, suppuration within the tube of the spine.

Evening. He is delirious, and like a man who is good-tempered in his cups: he talks continually, and invites the nurse to bed to him with very gay discourse. His stools and urine still pass involuntarily; pulse 130; weak.

17*th*. It has been necessary to tie him down in bed. He now appears dying; his breathing is

very quick and laboured; his pulse hurried; his countenance is sunk, and his tongue is covered with a brown fur.

About an hour before death, a change took place from that happy delirium, and groaning as, in much pain, he fell insensible, and died.

The eleventh dorsal vertebra was fractured in its body. The spinous process of the same vertebra was crushed. The spinal marrow did not appear to have suffered mechanically, or to have been crushed. Pus thick in consistence, and of a greenish colour, lay betwixt the sheath and the spinal marrow. There was an effusion of serum betwixt the membranes of the brain.

INJURY OF THE SPINE, WITH UNEXPECTED RECOVERY OF THE PATIENT.

Sarah Beddoes, 18 years old. *Bird's Ward*, 1*st Nov. Mr. Joberns's patient.* This girl was thrown from a window two stories high; her back struck the ground. When brought into the hospital, great tumefaction appeared opposite to the lower dorsal vertebra. One of the spinous processes was found to be crushed, and the spine, above and below, stood remarkably prominent. The lower extremities were not paralytic, nor the belly tumid; nor the bladder distended: her sufferings were confined to her back and loins. A wound was found at the bottom of the sacrum, which ran up-

wards, to the extent of four or five inches. It appeared to have been made by her falling on a spike or long nail.—A dozen leeches were immediately applied to the part injured, and repeated for three successive days.

It would be tedious to give the unvarying journal of this case. She was long supposed to be in the utmost danger, from the violence of the injury; for weeks she lay complaining and moaning in a pitiable state, in all which time nothing could be done but repeating the leeches, the fomentations, and poultices, which gave some relief, and administering the saline mixture of the house, with occasional laxatives and opiates.

She has for three months lain on her side, with her body bent forward, and her knees drawn up. This has been her posture of ease.

It is now eight months since this young woman was received into the house. Her lower extremities are contracted; her back is bent; she is extremely thin, and the knobs of the vertebræ are very distinct: two spinous processes stand out projecting, and leave an interval of two inches. She proves to have syphilis, and is sent into Hawkins's Ward.

15*th Sept.* This girl is dismissed from Hawkins's Ward, perfectly well, and a most remarkable change has taken place upon the spine; the extremities of the spinous processes have approached.

and she has regained her erect posture; she has at least recovered her shape in a manner quite extraordinary.

FRACTURE OF THE SPINE FATAL.

Thomas Wills, aged 30, admitted *Sept.* 24.—Being on the top of a neighbour's house, extinguishing a fire, he fell a height of two stories, and came with his back upon the pavement. No injury to the spine was to be felt, but he had lost sensation and motion in all the lower part of his body and lower extremities. The bladder and intestines were insensible to their natural stimuli: he complained of a pain in his back, and referred it to the middle dorsal vertebra.

He remained for six days in this condition; blood was repeatedly drawn, by cupping, from the sides of the spine; his bladder was emptied by the catheter twice a day, and he had a stimulating enema thrown up at regular intervals. Liniments were rubbed on the extremities, which, however, could serve no purpose but to ease the patient's mind.

When he had been in the hospital for six days, his breathing became more affected, and he had a slight hacking cough. Emulsions, expectorants, and opiates, gave no relief. He was bled freely from the arm. The symptoms continuing, and the blood being buffy, venesection was repeated: but the relief was not lasting, nor indeed very obvious. For the pain in the side,

and the difficulty of breathing, a blister was applied to the side. He had a mixture containing the mistura salina, tinctura scillæ, and æther.

About this time a consultation was held, and I was drawn attentively to observe his condition. He was quite sensible and collected, the lower extremities lay without motion, and quite insensible. The belly was full, but exhibited an unusual flaccidity; the respiration was performed by the heaving of the chest; and there was a catch in his breathing, from pain running round his ribs on a line with the injury of the spine. That the spine was injured appeared, not only from these symptoms, but also from a certain degree of depression of several of the spinous processes of the vertebræ of the back.

Repeated scarifications and cupping on the injured part of the spine were ordered.

Oct. 8th. In the evening his respiration became very rapid, being sixty to the minute. Ten ounces of blood were drawn from the arm, but without relief. The fæces passed involuntarily, the respiration became slower, and he died.

Dissection.

Much coagulated blood lay over the sixth and seventh dorsal vertebræ, and the spinous processes of these vertebræ were broken, the tube of the spine was forced in upon the spinal marrow, and a sharp portion of the bone had pierced and lay pressing upon the spinal marrow; a rib was fractured on the left side, the broken extremity of

which pressed against the pleûra. This side of the chest shewed marks of inflammation.*

SUDDEN DEATH FROM DISEASE OF THE SPINE.

—— ——, about thirty years of age, was brought into the hospital on Monday 22d July. He was found in Portland Road, fallen in a fit; and brought by strangers to the hospital. When brought in he was discovered to be quite dead: frothy blood appeared at his mouth, and it was supposed to have come from his lungs.

On examining the body nothing unusual was observed in the abdomen or head, or in the viscera of the thorax: but on turning back the lungs a tumor appeared in the posterior mediastinum, exactly resembling an aneurism of the descending aorta. On prosecuting the matter further, however, the aorta was observed running closs upon the tumor, but not making part of it. On opening the sac it was found to contain a thick mass of scrofulous matter, in contact with a carious portion of the spine. On clearing the matter away, the bodies of the vertebræ were found eroded, and the inter-vertebral substance also destroyed in part, so that the spinal marrow was exposed.

From his sister I learned that he had that day

* It is important to observe, that the splinter which crushed the spinal marrow, belonged to the body of the vertebræ. It could not have been removed by operation.

taken a long walk into the city; that, after such walks on former occasions, he would complain of great pain in his back: that all the complaint which he had was this pain in his back, for which he had taken the advice of many doctors, but nothing had relieved him. On further question, she allowed that he was subject to a palpitation, which was sometimes very distressing. He had experienced no impediment to swallowing, notwithstanding the tumor seemed to press upon the œsophagus, and no difficulty of breathing.

CASE OF DIASTASIS OR SUBLUXATION OF THE SPINE, FATAL.

March 29th, 1816.—*Marshal*, a coal waggoner, was brought into the hospital from Edgeware; the account given by the people, who brought him, was rather confused. They agreed, that he had been riding on the fore-shaft of his cart, and by a sudden jirk was thrown off, and pitched on the back of his neck and shoulders. The man was somewhat intoxicated, and could not give a distinct description of what befel him. When carried into the hospital, he was put upon his legs, but he could not stand; and when supported by the shoulders, he dragged his legs after him. At this time he complained of pain in his loins, but no injury was perceptible there. Between his shoulders, however, there was a degree of swelling and discolouration. Some of the people who were

with him said that the wheel of the cart (which was empty) had gone over the small of his back; but after the first day he never complained of that part. Leeches were applied to the spine betwixt the shoulders, and his bowels were opened.

For nearly a week he lay without complaining of any thing, except stiffness in the back part of his neck, and up to this period he had no symptom of paralysis; on the contrary, he could throw his arms and legs about, and retain his fæces and urine, and expel them naturally.

On the 8th day he was almost instantaneously seized with convulsions over the whole body. He was relieved, in some degree, by bleeding, and continued sensible though his jaw was locked.

His pulse, at this time, was very strong. Two hours after the first bleeding the convulsions were returning with more violence, when he was bled a second time. A few minutes after the second bleeding his lower jaw moved with great rapidity, and continued moving in an extraordinary manner for nearly five minutes, when all at once he exclaimed, with great animation, that he could speak. From the moment he began to speak he appeared to be maniacal, for his expressions had by no means the appearance of common delirium: at this juncture he clearly proved, by his exertions, that he was not at all paralytic, for it required two men to hold him, and he almost sprung out of bed to be revenged on the nurse.

He passed a great deal of fæces and flatus with singular force, for he evidently had the command of the sphincter, saying, at the time with a smile, beg pardon Dr. ——, while he indeed used little ceremony. On raising him up to put on the strait waistcoat, he complained of pain in the back of his neck, but as there had been a blister on it we could not, from his description, understand whether it was the pressure on the skin, or something internal, of which he complained. In the course of an hour he was perfectly composed, so that from the first attack of the convulsions to his being again sensible, a period elapsed of twelve hours. In the morning he had such marked typhoid symptoms that the physicians were called to him; at this time he had so far regained his senses, that he answered questions pretty distinctly, but when left to repose fell into a low delirium. On the third day after the attack of convulsions, he complained of difficulty in using his arm; and two days after he had total palsy of the lower extremities; he altogether lost the feeling in them, which was the more remarkable, as at this time he regained the use of his arm. He lived for a week after this, but continued sinking, and still retaining about him much of the character of typhus fever. The day before his death he was perfectly sensible, and had recovered sensation in his legs; for he could feel the rubbing of a finger upon them. At this time, though he appeared to

pass his fæces involuntarily, still he passed them with great force, and he was able to reject an enema which was given contrary to his desire.

Dissection.

The brain was examined carefully, and nothing was remarked except a little effusion between the pia mater and tunica arachnoidea. On cutting the muscles by the side of the last cervical vertebra a little pus oozed out, it was found to come from between the vertebræ. On dissecting up the muscles, there was found to be an evident loosening of the last cervical from the first dorsal vertebra. A few of the dorsal and cervical vertebræ were removed, and then it was distinctly seen that there was a considerable space between the last cervical and first dorsal vertebra, the intervertebral substance was completely destroyed, and an immense quantity of pus surrounded them. On the back part the pus had extended under the scapulæ, and on the fore-part was bounded by the œsophagus. On examining the spinal canal the pus was found to have dropped down through the whole length of the sheath to the cauda equina.

Observations on the last Case.

Authors considering the strength of the intervertebral substance have said, that the dislocation of the bodies of the vertebræ from each other was impossible. It is true, that commonly the body of

the vertebra gives way before the ligaments yield. But here is an instance of diastasis or subluxation of the bodies of two of the vertebræ. From Hippocrates to the multitude of French authors who have touched upon this subject, dislocation has been considered in no other light formidable, than as producing pressure on the spinal marrow. But this case serves well to shew, that luxation will prove fatal, even although the spinal marrow be not bruised.

The last writer who treats of this subject is M. Boyer. He observes, that in the violent bending forward of the spine, the ligamenta interspinalia are sometimes ruptured, but that no bad consequence results; rest restores the part. But the rupture of the ligamentum subflavum *(ligament jaune)* is followed by paraplegia and death, and without doubt, he adds, it is because the spinal marrow itself suffers distention. The foregoing case will place this matter in another light. It is the progress of inflammation to the spinal marrow, and not the pressure or the extension of it, which makes those cases of subluxation and breach of the continuity of the tube fatal. The alternation of symptoms in this case is worthy of attention.

DISLOCATION OF THE PROCESSUS DENTATUS OF THE SECOND VERTEBRA SUDDENLY FATAL.

A man was trundling a wheelbarrow in Goodge-street near the hospital; in wheeling it from the

roadway upon the pavement he felt some difficulty, and had once or twice drawn it back to give it the more powerful impetus. When at last the slight incumbrance was overcome, the barrow went suddenly from under him, and he fell with his chin upon the curb stone: he was instantly motionless, and although it was only a few yards to the hospital, when brought in, he was quite dead. Upon dissection it was found, that the tooth-like process of the second vertebra, which threads the ring of the atlas, had broken from the hold of its ligaments; and, the transverse ligament yielding, the process had crushed the medulla oblongata.

Under the head of Counterfissure, in the First Report on Fracture of the Skull, another example of sudden death from injury to the medulla oblongata will be found.

This sudden death will remind you of the different effects of an injury to the spine, according as it is higher or lower on the column. When the fracture is low it is attended with loss of sensibility. and motion in the lower extremities and disorder of the bladder; when the injury is higher up the abdomen suffers more distention; still higher, the respiration is affected; and when the fracture is above, the principal origin of the phrenic nerve, the act of respiration is stopt, and death from suffocation suddenly follows.

PREPARATIONS ILLUSTRATIVE OF THIS SUBJECT IN THE MUSEUM.

—— A pistol ball has passed through the body of one of the vertebræ of the back, and lies pressing on the sheath of the spinal marrow.

—— A triangular portion of a fractured vertebra is sunk into the spinal marrow.

—— The vertebra fractured, has united again, and the perfect union shows that the patient must have long survived the accident. Yet he died paralytic of the lower parts of the body, supposed to be in consequence of the pressure of these inequalities.

—— The spine fractured, but the spinal marrow not injured. But this appearance is deceitful; for although the spinal marrow was not crushed, it became inflamed, and was the cause of death.

—— The vertebræ of the neck having suffered diastasis or subluxation, the intervertebral substance is seen to be wasted in suppuration, and inflammation being communicated to the spinal marrow it had extended in the whole length of the sheath.

—— Caries of the vertebra of the back affecting the spinal marrow; without any token of so formidable a disease, the man fell down suddenly and expired.

—— Vertebræ and theca laid open, exhibiting a scrofulous tumor similar to what we find in the brain, occupying the spinal marrow.

I shall subjoin two examples of the consequence of a lesser degree of injury of the spine.

CASE OF INJURY OF THE SPINE, ATTENDED WITH AFFECTION OF THE LOWER EXTREMITIES.

Fineckin, aged 33.

It appears that he fell down a shaft full forty feet in depth: he complains of having hurt his back. There is uneasiness and defect of action in the lower extremities. Ordered a laxative mixture, and to be repeatedly cupped by the side of the vertebræ of the loins.

About eight days after his reception into the hospital he began to complain of languor and universal pain; of sickness and debility. His pulse was quick, and his skin hot. It presently appeared that he had an attack of typhus fever, and he was sent into the physician's wards. Three weeks afterwards, I was called to him; he had recovered from his fever, but still complained of pain in his loins, or torpor of his lower extremities. I again ordered scarifications and cupping in the extent of the spine, and stimulating liniments: he was discharged, relieved.

INJURY OF THE SPINAL MARROW, FROM A HURT ON THE SPINE.

A respectable tradesman, in mounting curtains to a window, fell from the steps, and struck the

lower part of the spine against the corner of a table. The bruise was severe, but he got the better of it by the usual remedies, and in the usual time. It was some months after, that he began to feel a want of power over the lower extremities; indeed the nature of this affection being a want of the full power of motion, and a defect of feeling, he did not attribute it to his former accident, the more especially as so long a time had elapsed before these symptoms appeared.

This man is about fifty: square, and stoutly formed, and of regular habits, seldom exceeding his pot of porter; his arms are so powerful that even now he can mount a ladder, drawing his more unwieldy extremities after him. He is active in mind and body, and the only apparent defect is in the exercise of the will over the lower extremities, for they have not shrunk nor lost muscular firmness.

When I first saw this man, I conceived that these symptoms might proceed from disorder of the lower part of the great intestines. From such a source of internal irritation we have very singular sensations of pain, and numbness about the hips, and stiffness, and spasm of the lower extremities. I therefore gave him calomel, with occasional purges of neutral salts. But when, after a period of two years, I was called in to consultation, and learned that outline of the case which I have delivered, I advised more moderate living, leeches to be applied along the course of the spine, from

time to time, and issues to be formed by caustic, opposite to the lowest lumbar vertebra. I have no doubt that these means have, and will continue to, prolong his life, and the enjoyment of that limited power of the lower extremities, which he now possesses.

These two last cases recal to mind one of the most interesting of the kind on record, that of the Count de Lordat, in the Medical Observations and Enquiries, Vol. III. He was overturned, and had his neck twisted in the corner of his carriage; after the accident he served two campaigns, sufficient evidence of the slow progress of that paralysis, which encroached at last gradually on every bodily function. The report is very striking. He appeared stooping, emaciated, and dejected: he could still walk with the assistance of a cane in a tottering manner: his left hand and arm were much reduced, and he could hardly perform any motion with them, the saliva was continually trickling from his mouth, and he had neither the power of retaining it nor of spitting it out freely. What words he still could utter were monosyllables, and these came out after much struggle, with a violent expiration, and in a low voice and indistinct articulation. In the last stage the functions were more and more oppressed, and often he was threatened with suffocation. Upon examination the membranes of the spinal marrow were found thick and tough, and the marrow itself

had acquired an extraordinary degree of solidity. The symptoms of the two slighter cases of palsy, which we have here are, I imagine to be explained on the same principle, viz. the injury to the soft envelope of the spinal marrow and the accession of inflammatory thickening. Such slighter injuries to the spine have produced a scrofulous tumor, which, insinuating betwixt the processes of the bone have at last oppressed the spinal marrow. *Med. Obser. Enq.* Vol. III. p. 160.

Review of the Cases of fractured Spine.

It is remarkable that a subject of this magnitude should have so little attracted the attention of the profession. I do not know to what books I can direct you: for authors have treated of the subject very superficially, and we have only some occasional cases in our books.

The cases which I have noted for your observation, make it evident that in injuries of the spine the danger to be apprehended is the same with that which accompanies injury to the brain; viz. the rising of inflammation, and the suppuration within the theca. This indicates the necessity of repeated general bleeding, or constant local bleeding while the danger continues. We also see the necessity of controlling the motions of the patient, whether at first as in the state of inebriety; or afterwards when delirious. The manner of accomplishing it, I shall not consider in this place.

The first question which it is necessary to

agitate is this: how far does the analogy hold in fracture and depression of the skull, and fracture of the spine with crushing of the spinal marrow?

I have not found a young surgeon who has entertained any doubt on this question; and some, who have just proceeded so far in their studies as to know why the depressed portion of the skull is to be elevated, I have found very decisive in their opinions, considering the operation as equally fit to be adopted in fracture and crushing of the spine. They confidently ask; where is the difference? a bone is injuring the brain and it is raised: a portion of bone is depressed upon the spinal marrow: let an incision be made and the portion of bone withdrawn!

They are encouraged in this by disquisitions in dictionaries of surgery, and by the discussions of lecturers. M. Boyer, the latest French authority on the subject, objects to the proposal only on this ground, that the indication is never sufficiently clear to authorise the operation, and our English authors object, because we might mistake concussion for fracture.

1. Now it is my belief that an incision through the skin and muscles covering the spine, and the withdrawing of a portion of the circle of bone, which surrounds the marrow, would be inevitably fatal. For it is not sufficiently observed, that the membranes of the spinal marrow are the most susceptible of inflammation and suppuration of the whole frame; not exceeded by those of the brain

itself, of which they are prolongations. The cases before us afford indeed sufficient evidence on this head.

2. It further appears, to me that the analogy on which this practice is proposed, is false, and that in truth there is no resemblance in the cases. When a portion of the skull is depressed, a comparatively small portion of the brain is injured by the intrusion; and were it possible to take away the part of the brain bruised by the bone, the function of the organ would remain entire. But when a portion of bone has crushed the spinal marrow, the entire diameter of the cord is crushed; and although it be but a small portion which has suffered, the injury of that portion is sufficient to cut off all connexion betwixt the parts above and below.

3. Nay, even if it were a sharp spine of fractured bone which had run into the spinal marrow (supposing that the injury then produced were sufficient to cause palsy of the lower parts of the frame) before that sharp spine of bone could be withdrawn, the circumstances would be so aggravated by the exposure of the spinal marrow, that inflammation, suppuration, and death, would be the inevitable consequence. Instead of diminishing the danger, the unhappy fate of the patient would be accelerated.

4. These cases shew how inaccurately the diagnoses of authors have been drawn. What tyro will not readily answer that paraplegia, dis-

tention of the bladder and intestines, are the immediate consequences of fracture of the spine.

Yet we see here instances of fracture of the entire body of the vertebræ, without such symptoms as can inform us of the nature of the accident. And in the progress of the case we see symptoms arising, which no one has hitherto pointed out, as proceeding from affection of the spinal marrow. Instead of loss of motion and feeling, you have seen the patient tossing in restless agony; an agony of mind without any definable suffering. Instead of palsy confining his lower extremities, you find him throwing himself suddenly out of bed, and at last rising in a wild delirium, which our observations hitherto would not lead us to expect, as a consequence of that sort of injury which is for the most part attended with loss of sense and motion.

5. The dissection in those cases proves the nature of this excitement. The great injury done to the spine, to the bone, is followed by inflammation, which is rapidly propagated along the membranes of the spinal marrow; and as is the nature of these involving membranes of the nervous matter, when inflamed, suppuration rapidly follows: and in the present example we find the pus dropping out from the sheath when cut across at a part far distant from the fracture.

Hence we see the cause of the general irritation, and of the oppression or palsy which follows.

The inflammation of the spinal marrow is attended with an almost universal nervous irritation, which is presently followed by excitement of the brain; in the mean time, matter is poured out into the sheath of the spinal marrow, and either by its pressure causing palsy, or by its irritation disturbing the function of the part, so as to be attended with the same consequences. The excitement of the brain being followed by effusion death ensues.

6. There remains a question of some moment, and on which, in discussion with my learned brethren of the profession, I do not mean my brethren of the hospital, I have had the misfortune to disagree. A man who receives an injury of the spine recovers from the immediate effects of the accident, but at the distance of months, instead of having the full use of the lower extremities restored, he begins to drag them more and more, and at length becomes totally palsied in the lower extremities, and languishes, and dies.

I have heard it proposed by very high professional authority, to cut down upon the spine and apply the trephine and raise the bone. This appears to me a most desperate measure.

In the first place, it is not proved that it is the bone which presses the spinal marrow. Indeed, I am confident, that in these protracted cases, when the palsy increases slowly, it is the thickening of the membrane which encroaches on the spinal marrow; or a diseased action which is

gradually more and more affecting the nervous matter itself.

It may be said, that although the pressure is produced by the thickened envelope of the spinal marrow, still it is the confinement of the bone which causes the membranes to press in upon the spinal marrow; and if, by taking away the part of the tube of bone which confines the membranes, freedom were given to them, the spinal marrow would be freed from pressure. But this is an idea too mechanical. On the other hand, I offer this view: the palsy is a consequence of the swelling of the membranes, and proceeds from inflammation; and if you cut down upon the bone, and saw it out, and expose these membranes, you will not only increase the swelling and thickening of the involving membranes, but you will most probably raise such direct inflammation and mischief, as to cut off the patient suddenly.

What then are we to do nothing in these desperate circumstances? I do conceive the case to be desperate; but that does not authorise us to attempt a remedy which is not only desperate, but which will not stand examination, and affords to me, I confess, no hope. We are to take up the case as a scrofulous inflammation of the spine, and I am certain, that much may be done by prosecuting the cure with energy and perseverance, by local bleeding and deep issues.

OF EMPHYSEMA FROM FRACTURED RIBS.

*I am happy to meet you again, and especially, because there is a subject on which I wish to address you: and you must excuse me for saying, that it is a subject of which you are criminally negligent. It is easy to know whether or not a student be properly educated, by observing the things to which he attends in an hospital, just as you may know a gentleman of liberal pursuits by his conversation, and the objects which interest him. You will presently observe the application of this remark.

There was an old Irishman, one of my patients in the accident ward, when I left town, in whom I took much interest, and often I drew your attention to the case, and made you feel his sides. To many of you I explained his critical situation. Shall I confess I was concerned to observe the little attention that you paid to this subject.

He was a man of 65 years of age. He had fallen from a ladder and struck his left side upon the corner of a chair; he remained at home for three days, until his master, having called on me, procured his admission here, to which you know his misfortune gave him a title without my influence. I found him sitting up in bed, suffering much from pain in his side, aggravated by a short cough. On examining the side, it was not possible

* From Clinical Lecture.

to feel the ribs, but you might perceive other evidence of his ribs being broken in the emphysematous tumor which covered them. He was fat, with that looseness of skin which is characteristic of his years; the skin was blown up, forming a tumor extending from the ilium to the clavicle.

There was no doubt that the rib was broken, and the lungs torn. I witnessed his situation with considerable uneasiness; but as he could lie down, and as he repeatedly affirmed he was easy, but for the troublesome cough which he said gave him pain in his side, I was satisfied with ordering him to be bled, and to have a linctus for his cough. I sent to inquire for him in the afternoon: I visited him in the evening: I sent again in the morning: and I saw him at twelve o'clock. The tumor spread further over the breast, and over the hips; but nothing untoward occurred. He continued better the 3d day; on the 4th he was still better. On the 6th and 7th day from the accident, the emphysema began to dissipate, and by the common attention to confine the motion of the rib, and keep the circulation low, he quite recovered.

Here was a case in which more was present to the understanding, than visible to the eye; he who had never studied would pass it with indifference, but the pupil who had read what Dr. Hunter had written on this subject; what Portal had delivered to the Academy of Surgery; what experiments Hewson had made; or who had felt the interest which Mr. John Bell had given to this subject in

his book of wounds; such a pupil would have looked with intense interest on the case. I wish that some among you had so attended to the case, I should not then have had to record the following instances:

Wednesday, July 6th, 1816. —— *Lynn*, a common labourer, was brought to the hospital in a state of insensibility. He had fallen from a scaffolding ten feet high, into the area below, and his side struck a cross bar of iron. His head was slightly grazed, but there was no other visible injury. He was taken up breathless, and apparently dead, and in this state he was brought to the hospital. When received, his breathing had been, in a great measure, recovered; fourteen ounces of blood were taken from his arm; gradually he recovered his senses, and as he grew better he became impatient to return to his home. He walked out of the hospital without assistance, and did not seem to suffer from the accident. The house surgeon had wished to detain him, as one or more ribs were fractured; he applied a roller around his chest, gave him some opening medicines, with injunctions to return if he found himself worse.

On *Friday*, the 3d day, it was reported that he was worse, having been delirious all night. The dresser went to visit him, he found him labouring under great difficulty of breathing, and on examining his chest, he felt a slight emphysema extending over the right side. He re-applied the flannel roller, and ordered the medicine to be repeated.

On *Saturday*, the 4th day, the same pupil visited him; a distinct emphysematous crepitation was to be felt, and the tumor extended widely in every direction upwards, upon the neck, and downwards over the hips, the whole being enormously swollen. Owing to the prodigious degree of tumefaction, combined with the deceitful feeling of crepitus in the integuments (the reporter adds) we could not detect a fracture.

He continues.—He was at this time labouring under great difficulty of respiration: his breathing was short and hurried, and very much like that where there is effusion in the chest, with a rattling in the throat, and constant expectoration of mucus. His countenance was bloated and anxious, his pulse 120, hard and contracted; his skin hot and feverish; he complained much of pain in his right side. Twenty ounces of blood were taken from him, which, for the time, appeared to relieve him considerably.

The same gentlemen saw him at ten o'clock. It is not of want of attention that I have cause to complain. The report continues.—They now told us that the patient had once or twice jumped up quite deranged, and appeared to be suffocating; his breathing was little improved, his pulse was still hard and frequent, and the blood last drawn was deeply cupped, buffed, and firm in texture. We had no doubt of the propriety of taking away more blood; conceiving that active inflammation was going on in the chest, we bled him again to

eighteen ounces, which as before gave him relief; the bandage was attempted to be renewed, but it could not be borne an instant, on account of the sense of suffocation it produced.

The man was now lying panting and struggling for breath; now and then he moaned, and seemed much exhausted with his exertions to get a free inspiration. The expirations rapidly succeeded the inspirations, he foamed at the mouth and was constantly spitting up frothy and yellow mucus matter. He had been sick and vomited once or twice. We left him relieved by the last bleeding; the pulse had fallen considerably.

Sunday, 5th day. Soon after we left the house last night the man fainted, but he soon recovered, and passed an easier night than before. This morning he is very pale, breathes still with great difficulty, and lies half comatose: the pulse is low and quick; the swelling of the chest, back, and neck, is increased. The blood taken last night is neither buffed nor cupped.

During the rest of the day he was low and feeble, and seemed quite exhausted. When questions were put to him, to discover the place and nature of his pain, he always referred to his right side, and complained of the oppression in his chest. We observed that his restlessness was greater at one time than another. He had no uneasiness of his head.

Monday, 6th day. He passed a bad night; seemed rapidly to be sinking; was now delirious,

and gasping at intervals; his pulse intermitted: he died at eleven o'clock this morning.

Remark.

If you did not know that this case occurred out of the hospital, and out of the knowledge of the surgeons, you would no doubt be surprized. If you did not know by whom this case was written, you would be surprized to see a train of symptoms so well described, and yet the nature of the accident so entirely misunderstood. I have made no change upon the expressions, unless to throw out some passages on the operation of saline draughts, injections, and digitalis, which to see, on such an occasion, is abundantly provoking.

Dissection.

The whole trunk was extremely swollen, with emphysema, but more particularly the right side. In opening the right cavity, we accidentally punctured the pleura, and gave exit to a great quantity of confined air. On examining the interior, we found the right lung quite collapsed. The left side was natural, in all respects. From the right side we sponged up about four ounces of blood, which we supposed had come from one of the intercostal arteries. On further examination, we found a portion of the lung lacerated, and laying in contact with the rugged edges of two fractured ribs. On moving each rib individually, we saw clearly that they had both penetrated the pleura pulmona-

lis, and opened the air cells, making a wound equal to half a square inch. There were five other ribs fractured besides those which penetrated the lungs. The surface of the lungs was red around the part injured. The viscera of the abdomen were natural.

Observations on the Case.

I need scarcely remind you of the true nature of this case. 1. The extremity of the broken rib, wounds the surface of the lungs—2. The enlargement of the walls of the chest in inspiration sucks the air through the lungs, and by successive motions accumulates it in the cavity of the chest—3. The lungs are then compressed, the side is kept elevated, and the freedom of respiration is checked—4. The distention of the cavity more and more, is at last attended with a disturbance of the other side of the chest; for the diaphragm is thrust down, the mediastinum pushed aside, and the capacity of that other side and of the lungs consequently, is so diminished, that the patient is every moment in danger of suffocation. What are his sufferings this case strongly proves. Here then ought to have been the triumph of surgery; for one touch with the scalpel, opening the side of the chest, and this man's sufferings would have been instantly relieved. The distention of the right side would have been removed by the escape of the air, the diaphragm would have been free to act, and the mediastinum would have regained its place, and

the left side of the chest would have resumed the freedom of its action.

The following Case is curious, from the degree of injury, and I may say from the absence of all unfavourable symptoms.

THIRD CASE OF EMPHYSEMA, FROM BROKEN RIBS.

Nov. 18. *Donald Riley*, 50 years of age. He fell from a height of twelve feet upon some iron bars: when brought into the hospital, he was very pale and agitated, and complained of much difficulty of breathing, with a sharp pricking pain in the left side. On examining this part, the seventh and eighth ribs are found to be fractured. A swelling extends over all the left side of the body; it is soft, compressible, and crepitating. Sixteen ounces of blood to be taken from the arm, and the tumor to be deeply punctured in three different places.

19. The tumor has not increased, the air has escaped in great quantity from the punctures; although the crepitation can be felt further forward upon the neck, the tumefaction is less prominent. His pulse is calmer; he can now lie down.

20. He has a constant cough, which gives him pain in his side. He breathes with some difficulty; pulse 70; tongue white; his bowels

moved by the house mixture: he has an anodyne linctus, for his cough.

21. He has been sick, and vomited; he is purged. The pulse is calm and regular; his breathing is much easier. The emphysema has not increased, but it has not in any degree diminished.

25. Breathes easily; emphysema diminishing; his cough is better, but he still has pain in the side, on making a long inspiration.

28. Much of the air is absorbed, and now the body is ordered to be swathed.

Dec. 4. Discharged.

We have here a case intermediate betwixt the first and second, in the degree of distention of the cellular membrane by the air. The punctures were made, not to prevent the air extending further over the body, which, though a frightful looking thing, is not attended with bad consequences, but to let the air escape more freely from the chest. If it had not had this effect, and if the breathing had not been relieved, I would have made an incision through the intercostal muscles, and punctured the pleura costalis.

I have observed, in common cases, that the air has been absorbed from the cellular texture about the sixth and seventh day.

I have in my last number advised my younger readers to keep Mr. Abernethy's works always near them. And on this subject of emphysema, it is natural that they should consult the same autho-

rity. But it is equally my duty to say that they will not, on this subject, find the distinct statement of facts, nor the lucid reasoning which in general characterizes the works of that gentleman.

We find him doubting whether the lungs collapse when the chest is opened; of opinion that there are two states of emphysema; and recommending the practice of Sir William Blizard, to bandage the chest, in order to prevent the air from escaping; and further, he combats the opinion, that the air collected on one side of the chest, oppresses the action of the opposite side. From the notions which I have heard expressed by very intelligent surgeons, on service, in the cases of wounds of the chest, it is evident to me that these opinions of Mr. Abernethy have had the effect of confounding the students' ideas upon this subject. I hope to have an occasion of returning to it, and of explaining the experiments on respiration, which have thrown an obscurity on this matter. At present I shall only add:

1. That in slighter degrees of emphysema, the patient generally does well. The practice is as in a common case of fracture of the rib. He is bled again, as the pulse rises, or when the breathing is oppressed; the chest is swathed, that he may be forced to breathe with his diaphragm, and give rest to the rib.

2. That in cases where the air extends far, still it is only frightful, and nothing need be done; but if with this there be much oppression of breathing,

we puncture and press out the air in the neighbourhood of the fractured rib.

3. That if the patient be still oppressed, we relieve him by giving free exit to the air, from the side distended, and consequently permit freer action of the other side of the chest.

4. That on all occasions, when emphysema appears, the patient requires to be strictly watched; for there may come a rapid increase of difficulty of breathing and the patient be suddenly cut off.

DISLOCATION OF ALL THE RIBS FROM THEIR CARTILAGES.

Sept. 5. *J. Herving* says he is 46 years of age: he appears much older; he is brought into the hospital with his sides squeezed together in a manner truly singular. In running across the horseway of a mill, thinking to take the shorter way, he was caught betwixt the beam and the wall. He was squeezed into a space of five inches, and was so wedged as to stop the horse: it was with difficulty that they got the horse backed so as to extricate him.

When brought into the hospital, he was pale and breathless, and a cold sweat bedewed his face and body: his chest was to the feeling like a dead body where the thorax had been opened, and the sternum left loose under the integuments; for on both

sides the end of each rib, at its junction with the cartilages, stood out distinctly marked and prominent. I concluded that the heart must have been bruised, and that he would not recover*. The clavicle of the left side was dislocated from the acromion scapulæ; he had cough, with pain in breathing; he was bled to 16 ounces, and a roller was put round his body, and the shoulders were braced back, by means of the figure of 8 bandage.

6. He passed a restless night. At present his breathing is little disturbed—indeed, he is easy, except when moved. The pulse, which was weak and fluttering last night, is now more steady; the bandage to be removed, and twelve leeches to be applied over the sternum.

In the evening he felt so much additional distress, from the absence of the bandage, that it was applied, and with evident relief.

12. This man remains quite free of pain; he has been bled again, but it has been in way of precaution, rather than from the presence of symptoms.

30. He is quite well, only the ends of the ribs, on the right side, still stand prominent.—There is in a case of this kind no means of reducing the dislocation of the cartilages but by causing the patients to inspire forcibly, and no means of relief but by bleeding and by the application of a roller around the chest.

* While sending this to the press, I learn that one of my patients, whose sternum was fractured, has died, after lingering, with more and more oppression, for five days.

FRACTURE OF THE RIBS NEGLECTED, AND FOLLOWED BY CARIES, AND BY SUPPURATION IN THE CHEST AND PERICARDIUM.

William Mark. In a wrestling match he was thrown, and his adversary fell upon him, striking his knee upon his side with all his weight and force. For three months he felt the consequence of this bruise, and a colourless swelling arose upon the right side of the chest, with great pain. He was a shoemaker, and during all this time he had continued to work at his trade. But as he changed his posture, and especially as he stooped and pressed the last to his breast, he felt severely the pain in the parts injured: yet it was not supposed that his ribs were broken. Six months after he received the injury, the swelling was punctured, and a Scotch pint of matter was discharged. The surgeon who opened the abscess told him that the ribs were broken. This abscess was under the pectoral muscle, and the matter spouted to a considerable distance, when the lancet was withdrawn. His breathing became now short and oppressed, with much inward pain. The discharge continued during the whole summer, when another abscess formed near the sternum. It was nine months after the wrestling match (to which he attributed all his sufferings) that I saw him; the following note refers to this period.

The abscess on the chest has been opened again, and now the several holes on the side of the chest are the mouths of sinuses, communicating with each other, and leading to the surfaces of several carious ribs. Attempts might be made to diminish the extent of these suppurating cavities, by drawing a seton through them, and using the restrictive bandage, but the cause would remain in the diseased ribs; besides, there is reason to suppose that there is abscess within the chest, as well as on the outside.

Three months after the first Report we have the following. The symptoms are those of confirmed hectic, from suppuration within the lungs. For weeks past he has had incessant purging, and he is now weak, and hardly able to crawl to stool, and the quantity of matter expectorated, threatens to suffocate him.

Dissection.

The principal external abscess was found under the pectoralis major and pectoralis minor muscles. The third and fourth ribs were fractured, and their surfaces were bare and carious to some extent; the bones were black, spongy, and immersed in fœtid matter. On opening the abdomen, the liver was found to have retreated altogether under the margin of the ribs, and the diaphragm to be drawn up very high. This was explained, when upon opening the thorax, the lungs of the right side were

found adhering to the inside of the ribs; they were firm, being consolidated by inflammation, and by this means the cavity of the chest was diminished, and consequently the diaphragm drawn up. The lungs were seen adhering to the pericardium, and that sac itself was inflamed and thickened, and distended with a purulent serum. The surface of the heart itself was rough with coagulable lymph and pus. And now it was found that the lungs of the right side contained a large abscess, which was in connexion with the communication betwixt the carious ribs, and it proved to have been from this abscess that the copious discharge of matter had flowed out in the dressing of the outward wound. With this abscess in the lungs, the cavity of the pericardium communicated, by means of an ulcerated hole in that membrane. The lungs of the left side, and what remained of the lungs of the right side, external to the line of adhesion, caused by the irritation of the carious ribs, were free from all disease.

Remarks on the preceding Case.

Some were of opinion that the ribs had not been fractured in this case; but that the part in contact with the ribs having been bruised, suppurated; that the matter lying in contact with the bones, had made them carious. But, without entering into the question, whether or not the contact of matter will produce such an effect on the surface of bone, I am of opinion that pus formed by a bruise in the side would not thus propagate itself in succession to

the ribs, the pleura, the lungs, the heart. On dissection, I found the ribs fractured, and rough with caries, and with irregular projecting points of bone. There was not cause sufficient to account for the fracture of the ribs, but in the first accident: and besides, a surgeon in the country, on first opening the abscess, had declared to the patient, that his ribs were fractured.

I have no hesitation in saying, that we have here an example of the formidable consequences of neglected fracture of the ribs. This young man continuing to go about his usual occupations, and work at his trade of a shoemaker, kept the broken ends of the ribs jarring and rubbing against each other. By which continued attrition, an inflammatory process was kept up, and matter formed around the fractured extremities. This, in process of time, we have seen to have affected the parts both within the chest, and the cellular substance on the outside, subjacent to the pectoral muscles. The cause of the great extent of the suppuration was in the continuance of the irritation. And if it be said that such a consequence would not have arisen, but in a scrofulous patient, I may admit it, and add, do not scrofulous patients break their ribs? and is it not most necessary, seeing these consequences, that the patient be carefully treated and watched in the first two or three weeks, and especially, that the broken extremities of the ribs be kept at rest by the swathing of the chest.

It was particularly distressing to see, this last week, a child in the waiting room with an abscess on the lower part of its neck, which had burst, and shewn its connexion with a broken clavicle. The careless wretch, its mother, had neglected the child, permitted it to use the arm unrestrained by a bandage, and this abscess and sore over the clavicle was the consequence.

SIXTH REPORT.

CONTAINING

CASES OF FEMORAL HERNIA.

The first series of these cases is illustrative of the manner in which incarceration and strangulation of the intestine take place. The succeeding cases explain the nature of the sac in this hernia, and the last refer to the treatment of the mortified intestine.

If the rising class of surgical pupils do not prove to be better practical surgeons than those who have preceded them, it must be owing to their teachers, and the wrong methods we take with them. I have witnessed the utmost anxiety of the students, to acquire a knowledge of hernia. Night and day have I seen them labouring at the dissection of the fasciæ. It is an investigation worthy their best endeavours; it is of much consequence

to follow a description with the edge of the knife; for it gives a precision to the motions of the surgeon's hand. But having made himself master of all the fasciæ and ligaments, I would tell the pupil he has still to commence the study of hernia, which has very little to do with the natural anatomy.

What is it that oppresses the mind of the just man and judicious surgeon on this very head? what is it that he revolves anxiously in his mind, is it the difficulties of the operation, the question of what produces the stricture, the thoughts of how many coverings the tumour has, or the place of the epigastric artery? No, it is this great question, when should the operation be performed? am I authorized to take the knife now? and have I not let the decisive moment pass! These are the questions to which all others are of minor consideration. I have seen the operation of hernia performed rashly, tediously, awkwardly, even ignorantly; but always with effect, if the surgeon were right in the grand matter of TIME.

To be able to distinguish symptoms, we must attend particularly to their cause, which is in the intestine. The changes to which the intestine is subject, has not been inquired into, with all that diligence which has been so happily exercised in regard to the anatomy of the rings.

I have in the following cases stated some occurrences in practice, which reflect light on the pathology of hernia; a subject which I had long

since unsuccessfully endeavoured to illustrate, by experiments on brutes. In vain I had endeavoured to noose the intestine of dogs and cats, and produce upon them the effects of strangulation. When the intestine was surrounded with a cord, the cord was in a few days carried within the intestine, and when the noose of string was made to embrace a turn of the intestine, instead of producing turgescence and strangulation, it was found to cut the coats; and, as the cord cut its way into the intestine, a new membrane covered it so that there was no breach in the intestine, and the alimentary matter, continued to be carried in its course, these cruelties were therefore of no avail.*

The futility of experiments on animals, when brought in illustration of the morbid changes of the human body, makes even a single fact observed in practice valuable; and I am well convinced by many failures, as well as by what I have observed in my friends, that it is in vain, by experiment on brutes, to anticipate the years of practice and actual observation.

We may consider the intestine, in a hernia, as subject to four different conditions: 1. It lies in the sac, its function continues, and there is no impediment to the alimentary matter: 2. It is included in the sac, and retained by adhesion; but it performs its function without interruption: 3. It is retained in the sac by *incarceration*, that is, in

* See preparations in the Museum illustrative of this.

consequence of its distention; but there is no stricture on the blood vessels of the intestine: 4. The intestine is *strangulated*, which is that state, when not only the alimentary matter is obstructed in the canal, but when the blood in the vessels is also obstructed, and there is momentary danger of mortification.

Without attending to these last distinctions, it is not possible to comprehend how the circumstances of cases differ essentially, while they are attended by exactly similar symptoms; or how a patient shall labour under signs of danger for many days, and recover; while another shall be cut off from hope, in as many hours. It is meant to limit the subject, in the first place, to this consideration of the change from incarceration to strangulation of the intestine; that is, from the state of obstruction of the alimentary matter in the canal, to obstruction of the circulation and consequent mortification of the gut.

We often find, in dissecting-room subjects, a small process of the peritoneum, like the finger of a glove, pushed into the abdominal openings, and empty. This is the first stage of the formation of a hernia, and I believe that even in the cases where the gut comes down suddenly, during violent exertion, there is a partial descent previously existing, making a predisposition to a more formidable rupture. The progress of the hernia is probably in this manner: a portion of the intestine, or small part of the omentum, is pushed

into the passage carrying the peritoneum before it. No bad consequence follows, because the intestine is withdrawn by its own action. But after this partial protrusion of the intestine has taken place several times, it is at last urged further, and the peritoneum bursts through the remaining confinement, and appears without the wall of the abdomen; then it forms a sac, for it is permitted to expand; the gut consequently is allowed to distend, and then incarceration and strangulation may succeed.

It is the object of the following case to explain the manner in which the gut fills.

FIRST CASE OF FEMORAL HERNIA IN A WOMAN.

A woman of 35 years of age was received into the physicians' ward, on account of *enteritis:* the apothecary, after hearing the account of symptoms, very properly inquired if there were any thing wrong in the groin; which the patient stoutly denied; but the old mother, who was with her, cried out that there was, and something very bad indeed! which proved to be the case.

On being called to examine her, I found her pulse quick and weak, her features sharp and cadaverous, her eyes wild. She moaned, and was

in pain, the expression of it being subdued through complete exhaustion. The belly was tumid, not hard: it was tender, and the tenderness was greatest near the groin; she described the pain as rolling from side to side in her bowels.

There was a tumor in the groin, and when she coughed, the percussion reached the tumor, although she coughed feebly. I learned, with some difficulty, that the swelling in the groin came during a strain, and that it preceded all the train of distressing symptoms: by her description, she must have had stercoraceous vomitings for some time.

Upon examining the tumor, I satisfied myself that it was a femoral hernia, and I saw plainly that it was not in a state for me to attempt reduction by pressure, without increasing the danger. Although the gentleman who accompanied the patient into the hospital said, very simply, "I gave it a squeeze myself, Sir, before I thought of troubling you," yet I believe the parts had not suffered at all by this squeeze, and hernia had unfortunately never before then, been suspected to be the cause of the symptoms.

The circumstances of the operation need not be further detailed than to observe, that there was nothing of that inflammation of the integuments and investing membranes, which we find in the last stage of hernia, where repeated attempts have been made to reduce it; and the vessels which

were cut across were inactive, and did not bleed freely, although they were of a size that we could discern their orifices.

The peritoneal sac was so weak that in pinching it up with the forceps (intending to cut it by carrying the knife horizontally), it burst, and dark serum was discharged.

The portion of the intestine included in the stricture formed a body an inch and a half in diameter, and was perfectly globular. It was of a dark reddish, brown colour, and adhered by coagulable lymph to the neck of the sac, on the side towards the ilium; a lacteal vessel was visible on the surface; it was large and tortuous, and loaded with colourless matter.

On separating the neck of the sac from the gut, which I did by drawing up the neck of the sac with my finger and thumb, a little matter exuded, which I hoped, from its consistence, might be pus; but on smelling it, the deplorable nature of the case was made evident: it was fæculent. This matter came so directly from under the sharp stricture, that I could not at first determine whether it came from the gut, or from the cavity of the abdomen.

Having cut the sharp edge of the stricture, and disengaged the gut from its firm embrace, I drew the intestine gently down. When this was done, there appeared no opening, but only a dark sloughy spot, obscured by coagulable lymph, nor could I find the passage into the gut with the

point of the probe; I therefore pressed upon the belly, when liquid fæces came out from the sloughy spot of the intestine, and I knew that the fæculent matter had originally come from this opening. I next pressed the portion of the gut which had been included in the hernial sac, and which till now retained its globular form; from this portion of the gut there flowed nothing but a clear mucus, of the consistence and appearance of jelly, which had been shaken or broken down. This mucus proved to be the whole contents of this portion of the intestine, and when it was pressed out, the intestine was flat, and could have been reduced. I brought down the torn part of the gut, so as to prevent the fæces escaping into the abdomen. I saw the patient dying; the discharge of fæces showed me there was no immediate occasion to do more. I dressed the parts lightly, waited to see her recover, but she continued to sink *.

The nature of the matter contained within the gut gives us proof of the manner in which those very small portions of the gut fill by their secretions, and we may follow the changes thus:

1. The portion of the intestine was pushed down when the young woman strained herself: for a time the intestine lay empty, and the stricture was so tight that no alimentary matter was admitted into it. 2. But the tightness with

* See Concluding Remarks on this subject.

which the stricture embraced the intestine was not so great as to stop the circulation of the blood in the vessels of the intestine. The intestine, therefore, remained alive, and in no danger of strangulation, while it remained empty. 3. The vessels, however, continuing to secrete into the cavity of the intestine, such an accumulation of mucus was at last produced, that the portion of the intestine became fully distended, and then there was imminent danger of strangulation. 4. As the included portion of the intestine became filled, the angle of reflection formed over the sharp edge of the stricture, increasing every hour, the coats became so tightly drawn against the edge of the stricture, that they were first gorged with stagnant blood, and, finally, the circulation was stopped. *Strangulation* then took place, and *mortification*, or the *ulceration* of the intestine by pressure against the tendon.

Thus we may see how an intestine strangulates itself; how it fills by its own secretions, until an effect is produced equal to the binding of the stricture, although the tendon be passive, and of a nature not liable to change. The stricture operates in retarding the free return of the blood by the veins of the intestine, and the consequence is not only a distention of the intestine with secreted fluid, but an infiltration into the coats of the intestine, which produces a thickness in them, and a sensation to the feeling of fleshiness in singular contrast with that part of the gut em-

braced by the stricture. I have observed, that in this case there was a turgid lacteal seen upon the surface of the strangulated intestine. In the state of mere incarceration, no doubt these vessels are active, and retard that perfect fulness which proves so fatal: but by the increasing tightness betwixt the intestine and the neck of the sac, the larger lacteals must loose their office, and partake of the general turgescence.

I beg my reader's attention to one circumstance of this last case. We see here the necessity of drawing down the intestine before attempting the reduction; not only to bring the firmer part of the gut opposite to the stricture, but to examine the part, for in such a case as this, if the intestine were to be reduced, the fæces would be freely discharged into the cavity of the abdomen.

In hernia, the signs of danger—the hiccough, the vomiting of fæces, the filling of the belly, the tormina, have not a direct relation to the strangulation of the gut, nor to the state of the gut included in the herniary sac. These signs proceed principally from the state of distention of the bowels within the belly, and are a consequence of the obstruction; they do not, therefore, accord with the actual danger, in as far as that danger depends on the inflammation or mortification of the gut included in the hernial sac.

As obstruction and consequent fulness of the intestinal canal are the sources of the more urgent

symptoms, so we find that when the vomiting is free, and the discharge by this means copious, the other symptoms are in a less alarming degree, of which the following case is an example.

II. CASE OF FEMORAL HERNIA IN A MAN RENDERED OBSCURE BY AN INGUINAL HERNIA, AND THE PATIENT LOST BY THE UNIMPRESSIVE CHARACTER OF THE SYMPTOMS.

A gentleman 63 years of age, and living at the time thirty miles out of London, perceived a small tumour in his groin. This swelling coming in circumstances which, to his confused notions, gave him the idea of its being a venereal bubo, although he had pain and vomiting from the commencement, he threw himself into a mail-coach, and came to town. This gentleman first felt the tumour on Saturday morning, he came to town on Sunday, and I was called into consultation on Monday, after my lecture; I found him sitting in his parlour, drinking a large basin of tea; and as he was receiving his friends, I heard them compliment him upon his good looks. There was, to my observation, an unnatural excitement about him. He was animated and restless. I saw him vomit the tea which he had been drinking, and the vomiting was easy, and without distress, or such exertion of retching as accompanies a common fit of sickness.

Still my patient was of opinion that his complaint was a bubo. I examined and found a tumour, which, though occupying the place of inguinal hernia, I thought came from under the femoral ligament; and so certain was I that it was a hernia, that I laid him down upon a sofa, and endeavoured to reduce it. I desisted, and ordered him a stimulant enema. I returned about three hours after. I became alarmed. I ordered the family to be informed of his danger, and requested the surgeon, in whose opinion I had nearly an absolute reliance, to be sent for. In the mean time, I took my patient in a sedan chair to the hot bath, and there made some further attempts to reduce the intestine.

We met in the evening, and the gentleman for whose advice I had anxiously waited, said, that he did not conceive that the case was hernia! the operation was, therefore, at this meeting out of the question. We met again next day at one o'clock. I had, in the interval, seen the patient, and from the continuance of symptoms, the manner of his vomiting great quantities of fluid with little distress, I conceived that we would be of one opinion, and I had my assistant, with instruments, in waiting. We now agreed that it was a hernia; but my senior consultant saw no occasion for the operation. There were no pressing symptoms, no sign of strangulation, no apology for hurry. He was to leave town, and proposed to meet me the second day hereafter. The patient

died the succeeding day. His strength held up until the tobacco clyster was administered to him, after which he very suddenly fell low, and sunk.

Upon examining the body, I found an inguinal hernia, and concealed by it, and under a load of fat, I found a small portion of intestine, strangulated by the femoral ligament. This was the cause of death; and the journey in a coach over thirty miles of bad road had been decisive of his fate. This was a great mortification to me, and I need not add, that I felt I should have been more decided. It was not the first example of the kind which I had seen.

III. CASE OF FEMORAL HERNIA ALLOWED TO SLOUGH.

I witnessed a difference of opinion on the occasion of an obscure tumour in the groin: some said it was a bubo; some that it was a hernia. The patient naturally sided with those who were against operating, arose from bed, and contrived to walk five miles with a hernia, in the last stage of strangulation. Hearing that he died, I followed him, and on dissection found the included intestine a putrid rag!

How much happier are the poor, who are admitted to a well-regulated hospital! how often have we to wish that our rich patients were laid on a pallet and iron bedstead, where the dictates of

sound reason and humanity might have free exercise.

IV. CASE OF FEMORAL HERNIA.—OPERATION SUCCESSFUL.

Holden. French Ward. See p. 111.—In visiting this patient, he tells me his rupture has come down, and that he cannot return it. I find a small soft tumour in the left groin, with a neck coming from under Poupart's ligament. I have not been able to reduce it. I have made the patient continue to press his hand gently against it. He is ordered to be bled, and put into the warm bath, and then the house surgeon is ordered to try gentle and long continued pressure on the hernia.

In the evening it was announced to me that the hernia was strangulated, and the patient very ill. I found him in great pain, but without much tension of belly; no hiccough, no vomiting, but only pain in the belly. I made an effort to compress and reduce the tumour, but did not succeed. Large clysters had been repeatedly administered. Aware of his danger, yet considering the short time the tumour had been down, its softness, and the absence of tension and sickness, I thought it better to let him lie for the night.

℞. Ol. Ricini ʒss, Vitelli ovi, Aq. Menth pep. ʒj. Tinct. Opii gtt. viii. Capiat haustus et rep. Enema.

June 24th. This morning I found he had put on his truss, insisting that the tumour had gone up. He expresses a desire to go home: but the hernia is not reduced. The evacuation he has had is only of the lower part of the gut. He is alarmed, and the truth is no longer to be got from him. Repeat the castor oil.

25th. He has been vomiting; no relief downwards. *Six o'clock.* The tumour is harder: he has had fæculent evacuations, from a large enema of solution of neutral salts and senna. He has vomited a chamber-pot full of fluid. I saw him vomit just now: he does it easily, emptying his stomach with little exertion. I asked him if he was as sick as at some former times, when his stomach was disordered. No, he said, he was not very sick. He has hiccough.

A consultation being called, and the symptoms still continuing, the OPERATION was determined on, for these reasons—1. The tumour harder, and no hope of reducing it: 2. The countenance more shrunk, and the pulse quicker: 3. The peculiar nature of the vomiting.

Operation.

The incision was begun an inch and a half above the Poupart ligament *, and continued be-

* It is necessary in this operation to have room upwards, and to clear the ligament on the neck of the sac.

low the tumour*; a small artery was cut, a branch of the epigastrica superficialis: a considerable quantity of fat lay over the tumour, which, when it was cleared away, the tumour appeared so distinct and round, that it did not seem to the spectators to have any fascia covering it.—Several successive layers were dissected, by raising the membrane with the forceps, and carrying the knife horizontally, then introducing the directory, and cutting upon the groove; the last layer was so strong and tense, that it was difficult to catch it with the forceps and pinch it up. On exposing the gut, a very small portion of bloody serum escaped, and the gut rose freer from its bed. The colour of the intestine was like a ripe cherry†; there was a slight degree of fleeciness on the surface, but no adhesion had formed.

The portion of intestine was so closely embraced that it could not be drawn down, to extricate the part long pressed, and consequently tender from the embrace of the stricture. The stricture being cut with the probe pointed bistoury and directory‡, a portion of the intestine was then

* Because it was small and deep, and required to be fully disclosed.

† When in a degree further advanced, the small knuckle of intestine more resembles, in form and colour, a small plum.

‡ The semicircular connexion established betwixt the Poupart's ligament, and the sheath of the vessels of the thigh. Op. Surgery, Vol. I., p. 286. It is more accurately stated in a pupil's case book. Mr. B. introduced a directory rather on the

drawn down; and here a remarkable contrast was observable, betwixt the portion long included in the hernia, and that newly brought down, in the paleness of the latter, and the dark red of the former. The intestine being now gently pressed, the contents went up, and the flat piece of gut was easily reduced. No stitches were used, the integuments were brought together by adhesive straps, on these a compress was laid, over this a broad strap, then a compress soft and like a cushion, and finally the double headed roller was applied.

6th. The patient's countenance much improved; he has had two full evacuations.

7th. The evacuations are as they ought to be, but his tongue is parched; he has great thirst; his pulse is frequent; he has no appetite; he is desponding, and "wishes it were all over." It is needless to follow the account of this case, for the symptoms were mixed, as the patient was at the same time suffering from an abscess in the perineum; he recovered, without a bad symptom recurring in any way connected with his rupture.

When a small portion of intestine is strangulated, mortified and burst, the fæces are freely discharged, and fæces being found in the sac, we are led to suppose that they formed the contents of the strangulated portion of the intestine. But the

pubic side of the gut, and cut a very small part of the *deep fascia*, having passed the straight bistoury along the groove, he raised his hand and cut the edge of the fascia; after this, relaxing the parts, by raising the thigh, the gut was easily reduced.

fæces come from the intestines which are within the belly. The circumstances of the first case very well illustrate this fact, that the strangulation is from the distention and consequent form of the intestine, not proceeding from the direct consequence of the stricture, since as soon as the distended intestine bursts, the contents of the intestinal canal have free egress. I shall give another example, although the case be one of familiar occurrence.

V. CASE OF FEMORAL HERNIA, EXPRESSIVE OF THE WORST SYMPTOMS, AND OF THE STATE OF THE INTESTINE IN MORTIFICATION.

Mary Lane, æt. 52, is just now admitted into the hospital. She has been subject to hernia for some years; formerly, when the swelling appeared, she could always push it up; but last Thursday it came down after a hard day's work at the washing tub, and she has not since been able to reduce it. From the time it came down, she has been sick, and what she has vomited has had a fæculent smell. This is the sixth day, and now, for the first time, she has seen a surgeon.

An irregular tumour extends from the pubes to within two inches of the superior spinous process of the ilium of the right side, a blush is over the whole surface of the tumour, and it feels irregularly hard, like the caking of the integuments around a

diseased gland. There is an appearance, as of the pointing of an abscess, for there is a point more prominent and soft, and evidently containing fluid. On further examination, there is crepitus; it is not a watery fluid, but air which is contained within this part of the tumour.

This poor woman's face indicates that there is no hope. There is a character of the eyes, declaring that she is struck with death; the features are shrunk. The belly is tumid, but soft and painful on pressure; the pulse is small and quick. She had an evacuation from the bowels last night, which, however, on inquiry, proves to have been in very small quantity. While preparing for operation, she has one of her attacks, which come in paroxysms; during it she rolls in bed, and cries aloud, which, with the death-like aspect of her face, declares her extremity; during these paroxysms her pulse is not to be felt.

In operation, unusual difficulty was experienced in dissecting back the skin from the tumour, for it was thickened and condensed by inflammation. But having exposed the tumour, the soft and prominent part of it was found to be a vesicle, thin and distended with air, and which, both in colour and the character of its vessels, had a remarkable resemblance to a portion of intestine. Layer after layer of this thin membrane being lifted on the directory, it burst, and discharged a fluid of the consistence of cream, yellow, and very fœtid, evidently feculent.

I laid open the sac, let out more pus and air,

and fæces, and then appeared the intestine, shrunk and flat, and covered with coagulable lymph. From which latter circumstance, it bore so faint a resemblance, either to the natural intestine, or to what is usually found in strangulated hernia, that I saw the necessity of pointing it out to the surrounding pupils. When the parts were sponged clean, I did not discover the holes from which the fæces came; but on pressing the belly, liquid fæces exuded freely, by three small holes in the intestine.

I need not carry this case much further. I opened the intestine; the fæces were discharged through the opening; there was no necessity of stitching the intestine; it was adhering. She died next morning.

Here was the proof, I sought, of the passage of the fæces being free, as soon as the intestine burst, and therefore shewing that the obstruction to the course of the alimentary matter, as well as the obstruction to the blood in the strangulated gut, is owing to the distention of the intestine itself, and to the form it assumes, and that in suffering these changes, the stricture is still passive, and that the passage under the ligament remains capable of transmitting the alimentary matter as before strangulation took place.

I have now, I hope, fulfilled my first object, which was to place these points of the pathology of femoral hernia distinctly before the profession. I hope that I have proved that incarceration results

from the sudden angle which the included intestine forms. And that when this has taken place the danger is imminent from a cause not hitherto noticed, viz. the secretion of the intestine itself.

From the cause of strangulation, being in the secretion of the intestine two consequences are apparent, viz. the greater danger attending small hernia, and the necessary increase of the danger as time elapses. While we are left to suppose that the intestine is merely full of fæces, which neither admits of increase nor diminution, we might be inclined to temporise; but if we understand that when a small portion of intestine is retained in a stricture, that it is filling by its own secretion, we see a further motive to early operation.

The next point which I have ventured to urge, is the danger of the rule to wait for symptoms. It has been my purpose to show that the symptoms have no correct bearing to the urgency of the case, and that they do not proceed from the state of the strangulated intestine, but from the general distention and excitement of the canal above the strangulated portion. Tormina-sickness and vomiting, and tension of the belly, even the character of the countenance, and the frequency and feebleness of the pulse, depend on the state of the bowels generally, and we find them in excess, while yet the intestine in the sac is natural; on the other hand, we find the whole of these symptoms but little urgent, when the intestine is fast approaching to gangrene. To wait for symptoms is therefore to

wait for the gangrene of the gut. The conclusion is obvious, we must study the distinctions as they are afforded us in examining the tumour; we must accustom ourselves to determine by the place, shape, sign, and hardness of the herniary tumour, whether an operation shall be required or not; when we have ascertained the tumour to be a hernia, when this tumour can not be reduced by the hand, and when the symptoms announce that the canal is obstructed, the sooner the operation is performed the better.

VI. CASE OF GRACE GLOVER. FEMORAL HERNIA, WHERE STERCORACEOUS VOMITING CONTINUED FOR TEN DAYS—THE PATIENT REDUCED TO A STATE OF INSENSIBILITY—SAVED BY THE OPERATION. [*Infirmary of Edinburgh.*]

The next case of this series which I shall present to my reader, was the first in which I publickly operated; and as the notes were taken very fully, I am in hopes an extract from them may prove useful in supporting our hopes during the most threatening symptoms of mortification.

This woman is thirty years of age. About seven years ago she lay-in of her eighth child; and three weeks after her confinement, in raising her washing tub, she found something came suddenly down into her groin. It produced pain as severe as a la-

bour pain, and continued with this degree of violence for two hours; and then she says, it went up, and she was as suddenly relieved as on the delivery of her child. About two months after this, she had a return of the rupture, with the same excessive pain. From this time she could not take her infant in her arms without danger of bringing down the rupture. These attacks continued for three years; after which she had a period of the same length without experiencing any inconvenience. But one day, after a long walk, she found the swelling descend again, and she became subject as formerly to its frequent return. When it descended, although it was painful, she could always force it up, until Saturday last.

On this day, she was sitting down to breakfast, when she was attacked with pain, and found the old swelling had come into her groin. She tried her usual applications, but they all failed. The pain became intolerable, and it continued night and day; and for a fortnight she was in this state of suffering and without evacuation.

This is her condition since she has been brought into the hospital. In the right groin there is a small tumour, compressible, and retaining for some time the impression of the finger; when touched it gives exquisite pain: purgatives and clysters of the most stimulating kind have been given without procuring stool; and she has had stercoraceous vomiting for ten days. An operation was immediately undertaken, but without much hope of success.

I shall here transcribe Mr. John Bell's note on the case book. "I have seen many desperate herniæ, but never one where the patient's death seemed so inevitable, so certainly prognosticated by the symptoms. I expected her to expire even upon the operation table; and as my brother was the operator, and myself the assistant, I was anxious that the consultation should be drawn out rather in the form of a protest, representing the operation as a necessary duty, but as a desperate attempt." She had the symptoms of internal gangrene; her voice was quite gone; her cheeks were hollow; her visage ghastly; her eyes turned up, and her eye-lids half open. Her arms lay still by her side, unless moved by the attendants; her hands were cold: her pulse quite thready, but equal and not intermitting. She was quite sunk and insensible, only screamed out deliriously, when she found herself laid amidst assistants.

Operation.

This poor creature, quite delirious, and apparently dying, was laid upon the table. The carrying her, roused her to that state of wild and disorderly violence, which makes our duty so painful: it had nearly prevented me fulfilling it on this occasion. A long incision was carried over the tumour, beginning pretty high up. The hernia now appeared covered with its fascia, and that being divided, the hernia somewhat flattened before, sprung up. The sac and its contents now appeared; but it was a

tumour which still required a little dissection before it could be understood. It was dissected all around, and still it presented more of the form of a tumour than of a hernia, as described by authors ;* for it hung like a glandular tumour, pendulous by its narrow neck or funiculus of vessels.

Proceeding to open the sac, the omentum presented of a dingy straw colour, very hard and condensed by the pressure ; and this mass, so unlike the natural omentum, looked as if we had only got into the heart of a tumour.

The omentum being drawn out and unfolded, it seemed to occupy the sac so entirely, that the gut might have escaped my notice ; but on careful examination, I found lurking behind and under the omentum, a small knuckle or single turn of the intestine. Without the conviction from the symptoms of there being a portion of the canal strangulated, and which led to a careful examination, the gut might have escaped us. It was of a dark colour and gorged with blood.

The finger was now pushed up to the neck of the sac, which was extremely narrow ; the bistoury was introduced upon the finger, and a touch, the very slightest imaginable, a nick of the knife, just sensible, and which would hardly have appeared on

* This is improper; for if the outside of the herniary sac be thus separated, it must slough after the reduction, being deprived of its vessels.

dissection was sufficient.* The gut went up easily; and after it the omentum was reduced.

The alarming symptoms in this woman, and which indeed continued, or returned at intervals for three weeks after the operation, were as follows: faintings, languor, vomiting, frequent low delirium, the eye being sunk, and the countenance cadaverous. There was much tension of the abdomen, with a tenderness so great, that she could not bear the touch of the clothes: then came diarrhœa, which threatened to extinguish her remaining powers. From this state of abdominal inflammation, she was saved, as it seemed to me, by covering the whole abdomen with blisters. Blisters, with leeches applied around them, and the warm bath, and opiates, are, in these circumstances, the means most to be relied on.

* I have again to observe, that it is the acute angle of inflection made by the gut, more than the narrowness of the stricture, which causes the difficulty of reduction in the femoral hernia. When the operation of cutting the stricture is done to no greater extent than is sufficient to let the flatus of the intestine, or the liquid contents of the intestine be returned into the canal within, there is no danger of cutting any important part. When the neck of the sac is cut, and with it, a quarter of an inch of the acute edge of the ligamentous arch, it will be sufficient; though all this ligamentous part may be safely cut up, to the commencement of the Poupart ligament. But there is a manner of doing this operation which is so natural and so safe, that I am sure many must have done it though they have not described it: having cut a little upward, and that proving insufficient, do not prolong the first incision to a dangerous length, but direct the edge of the knife differently, to the inside or to the outside.

My reader after perusing this case, will perhaps look back to the symptoms described in the second case. The symptoms assigned to mortification were here very distinctly marked; and the reason is obvious. These signs proceed from the state of general disorder of the intestines within the belly, obstructed and suffering from the accumulation. The portion of the intestine in the sac, was saved by being surrounded by the omentum, which prevented it rising in a sharp turn round the margin of the ligament, and saved it from being cut on the edge of the ligament, as happened in some of the preceding cases.

VII. CASE OF FEMORAL HERNIA—ADHESION OF THE INTESTINE TO THE SAC—THE OPERATION SUCCESSFUL.

A Surgeon reported one of his patients to have hernia, which he found was strangulated, and desired that she might be admitted. She was not brought into the hospital till the next day, and in the mean time, she had a smart dose of jalap and calomel given to her [* 1].

When received into the hospital, a small Femoral Hernia was discovered: her belly was much distended; she vomited frequently; she had pain on pressing the belly, within the ligament. Such are the symptoms which would influence me im-

mediately to undertake the operation. But it was reported that she had evacuation downward. On this account the operation was deferred.

Consultation. 10 *in the Evening.*

The symptoms continue: the belly swelling more; the tumour not harder, but distinctly pinched; and the neck of the sac exceedingly narrow. The determination depended on the answers to two questions: 1. Had every thing been tried? Yes, she had been bled and had been put into the bath, and had had large stimulating enemæ, and the taxis had been repeatedly attempted. 2. Had she relief in her bowels? No: the reports had been vague; but now it appeared there was nothing returned with the enemæ. These answers being received, the operation was determined upon immediately; for although the tumour was not hard, yet the vomiting continuing, attended with a tense belly, pain on pressure, and that pain felt especially at the neck of the sac; there was no time to lose. [* 2.]

During *the operation*,* it was remarked, that the fascia [* 3.] was particularly thin, so that being opened, it so much resembled the peritoneum, that the pupils, some of them very conversant with this subject, supposed the peritoneal sac [* 4.] to be the gut itself. But the peritoneal sac being pinched up with the forceps, burst like a bubble, and a quantity of clear serum jetted out. And now

* The operation was performed by Mr. Cartwright.

the gut was found but very little distended; not at all discoloured, and adhering by means of coagulable lymph to the neck and great part of the inside of the sac. [* 5]

I think I never saw the stricture on the neck of the sac so narrow. It required time and the utmost nicety to insinuate the directory. It could only be introduced on the side of the stricture towards the pubes. The probe-pointed bistoury being introduced upon the groove of the directory, and the stricture cut, it was not difficult to reduce the small portion of the intestine; for the coagulable lymph was as yet soft which formed the adhesion. The moment this was done, the serum rushed from the abdomen, and the stream of fluid catching tbe edge of the sac, made a beautiful exhibition of it; for it appeared like a hydatid, it was so thin and delicate.

On the third day, there arose pain and swelling in the abdomen; it was partial, so that the part she complained of, could be covered with the hand. This yielded to lecches and a large blister; and she is now doing well.

Remarks on the last Case.

* 1. It is very dangerous practice, to give drastic purges, when the intestine is strangulated; it overworks the intestines, which have no means of unloading themselves. May we attribute to this, the quantity of serum which was collected in the belly, and which ran out after the reduction of the gut.

*2. When we have ascertained that there is a hernia; that it produces vomiting; that it prevents evacuation downward; that it cannot be reduced; there is danger after this, in every moment of delay.

Mr. Cooper has said, that if he were himself the subject of strangulated crural hernia, he would only try the effect of the tobacco clyster, and if that did not succeed, he would have the operation performed in twelve hours. If by strangulation be meant here, that tightness which deprives the gut of circulation, twelve hours is a fearful length of time. The expression seems precise; but from what period are we to count the hours? Is it from the first coming down of the hernia? Is it from the time of the last evacuation—Is it from the commencement of pain and sickness?

When symptoms announce the canal to be obstructed, and when we feel a small hard herniary tumour rising from under Poupart's ligament; when we have failed to reduce that tumour by the taxis, aided by bleeding, large purgative clysters, and the relaxation or deliquium induced by the warm bath—lose not a moment in performing the operation with the knife, for the danger is imminent.

*3. This envelope ought not to be called a *fascia*. It is the cellular membrane, which the peritoneum pushes before it in its descent, condensed and become firm; and accordingly it surrounds it on all sides, and has a narrow neck like a bottle.

*4. The proper sac of the femoral hernia, is

purely the peritoneum, and instead of being thicker than that membrane, it is transparent, and very delicate. It is not easily distinguished from the intestine, unless it be from the conviction of the Surgeon, that he has not previously divided the peritoneum, and by the superficial and long course of the vessels which are visible upon its surface.

* 5. My reader will observe that I here state a fact, at variance with the theory which I have offered in the preceding pages. Here is strangulation without distention of the gut in the hernia. There are some other circumstances here which may be worthy of attention: viz. the gut was not discoloured, and it was coated with coagulable lymph. I attribute the lesser degree of fulness in this portion of intestine, to the distention of the sac with serum; for although the whole tumour was very small, fully an ounce of liquid escaped from it when the sac burst, consequently the intestine could not assume its usual rounded and distended form.

VIII. CASE OF FEMORAL HERNIA, WHERE THE SAC WAS REDUCED ALONG WITH THE INTESTINE, THE OPERATION SUCCESSFUL.

I WAS requested to give my opinion on a case of strangulated hernia. I found a woman of 46 years of age, with a tumour in the place of femoral hernia. It was circumscribed, smooth, elastic, and I could feel the neck of the tumour going under

the ligamentous arch of the thigh. The belly near the neck of the sac was tender on pressure [*].

On inquiry I found that she had been subject to a rupture for five years; but that heretofore she could always put it up. That on the preceding day, in the morning, she had eat something which had disagreed with her, and made her vomit. During the exertion of vomiting the tumour came down, and she could not put it up. This had happened at 12 o'clock, and it was now 7 in the evening of the second day. I had no doubt that the case was hernia. The next inquiry went to what had been done. She had been bled, repeated doses of calomel had been given, she had been put into the warm bath, enemæ had been thrown up, and the taxis attempted.

She was now in great pain, and under great alarm. The pain came in paroxysms of about six minutes duration; she vomited a foul turbid and fœtid fluid. In attempting to reduce the hernia it felt as if it yielded; it seemed to disappear, but the tumour was only pushed lower or deeper; when the fingers were removed it rose to its former volume, and no part had been reduced into the belly. The neck of the sac was indeed to be felt so narrow, and so distinctly nipped by the ligament, that I had no expectation of the woman's life being saved, but by an operation; the woman had resolution immediately to accord. The sur-

* This is a very important indication.

geon operated with great deliberation, and very successfully: with the blunt hook the several layers of membrane were raised up and dissected off; at length the sac assumed a transparent blackness. A gentleman present said it was the intestine, which arrested the operator's hand; he proceeded to introduce the directory under the ligament, and with the bistoury cut the stricture, in a direction upwards and outwards. He now attempted to reduce the hernia, and I thought that the intestine at this time went up; of this, however, I can not be certain; he resumed the bistoury, cut the ligament a little more, and separating a few adhesions, he then reduced the whole tumour.

The same evening the woman had two copious evacuations; in the morning she was quite comfortable, having neither pain nor sickness. I visited this woman twice after the operation, and there was nothing remarkable, unless the singular appearance of the wound, which seemed to heal by the first intention; for I must allow that I never saw an operation of this kind look so well, there was a mere line of adhesion. However, it afterwards broke out into suppurations. She had some tendency to disorder in her stomach and bowels, which was relieved, and she got quite well.

Remarks on the Case.

In the femoral hernia, the proper sac, that is to say, the process of the peritoneum, is quite peculiar in respect to its thinness and transparency; and

the slighter adhesions which it has to the surrounding or outer sac; we have seen in one of the preceding cases, that the membrane left, after the reduction of the gut, was so transparent, that when the serum flowed from the belly, and filled the sac a second time, it appeared like an hydatid; and in the last example of all, the colour of the intestine was given to its membranous covering, in that degree, to make the surgeon reduce both the gut and the peritoneum; for myself, I must confess, that I was for a moment mistaken, and both the sac and intestine were reduced before I had an opportunity of giving an opinion, which, during an operation, is a delicate matter, unless it be asked.

The success in this operation was perfect, which makes it the more necessary to consider the subject, else, in imitation of this, a practice may obtain which would be very dangerous. In the splendid work of Mr. Cooper, there is an example given, where, by mistake, the sac was returned with the intestine, the symptoms of strangulation continued, and the patient was lost. I have, in my Surgery, stated, that *Le Dran* reduced the sac with the intestine, and that the neck of the sac continued to embrace the intestine, and the patient died. It appears then, that it is not uncommon to mistake the peritoneal sac of a femoral hernia, for the gut itself; and who in this are to blame so much as those, who in their works fail to distinguish betwixt the difference of sacs in the several kinds of hernia? It is further evident, that it is possible to reduce both the sac and the intestine in the case of femoral

hernia; but is it allowable to do so? certainly not: for the intestine may be strangulated by the neck of the sac, in which it remains included*.

But a second question may be agitated, Is it allowable to reduce the intestine without opening the sac? that it is possible, this case proves: why it is possible in the femoral hernia, the knowledge of the nature of the sac and of the ligaments, informs us: but this also must be a very dangerous operation, and if attempted, no sort of violence must be used.

What I have called the outer and false sac of the femoral hernia, is by some authors called a *fascia*. Let us first endeavour to understand what this is, and then to give it a name. When in the operation, we have cut through the skin and cellular membrane, and pushed aside the bed of the inguinal glands†, and raised some loose and fine layers of membranes, we come to a dense coat, which, if we dissect it all around, is like a bottle with a narrow neck, which neck is embraced by the ligamentous arch of the thigh. This is an exact covering to the proper peritoneal sac of equal thickness all around, and the cellular adhesions, both to its out-

* This seems at variance with what has been delivered on the delicacy of the proper sac of the femoral hernia; but while the lower and exposed part of the sac is of extreme tenuity, the neck of the sac is some times firm as a cord.

† In cutting down upon the fat of the groin, we in fact cut through the *fascia superficialis*, which, however, has its fibres scattered and intermixed with the adipose membrane.

side and its inner surface, are so fine and so very easily torn even by using the handle of the knife, that the surgeon, who has not all his recollections about him, is very apt to mistake it for the peritoneal coat; which error leads him further wrong.

To call this the *fascia*, is to confound every thing, and to set a task for our demonstrators, which they never can execute, in shewing all which pertains to hernia, in the anatomy of the natural body. This membranous *bottle*, which surrounds the inner sac or peritoneal sac, is made of the cellular texture, external to the peritoneum, and which it meets with as it descends. This loose texture spread over the proper sac, being compressed, condensed, and suffering a kind of inflammatory process, is moulded into this regular form. It is, therefore, not a thing to be seen in the natural state of the body; it is a woof, the rude material of which is visible in the natural state; but the manufactory is completed by the protrusion of the hernia. For want of a little precision, both in the names we use [calling that fascia which is merely condensed cellular membrane] and in the description, the dissecting pupil is puzzled in his endeavour to discover parts of which he reads, and the surgeon is prepared for falling into the mistake of taking the sac for the gut, or making a discovery of a lusus: viz. one sac within another; and if we turn to the cases recorded of femoral hernia, where this circumstance occurred, we shall find reason for concluding, that the surgeons have been deceived

by the appearance of the outer, or false sac, and inner or peritoneal sac, which I have here described.

There remains a subject of some practical importance: viz. the treatment of the mortified intestine. I assisted a very particular friend in the following case, we were both young to the profession, when it occurred.

IX. CASE OF MORTIFIED INTESTINE, IN FEMORAL HERNIA, WHERE IT WAS THOUGHT NECESSARY TO CUT THE LIGAMENT AND RELIEVE THE GUT. [*Edin. Infirm.*]

Marion Brown, æt. 50. In the right groin there is an oblong tumour, extending from near the spine of the os ilii towards the labium; it is irregular, and in part compressible, inflamed, and painful to the touch. The abdomen is tense, and she complains of excessive uneasiness; her pulse is so languid as hardly to be felt; and her countenance is sunk. By the account of her friends, she has been subject to rupture for twenty years. Her present sufferings commenced twelve days ago, for then the hernia came down, and from that time she has been obstinately constipated.

Notwithstanding that this woman had suffered with symptoms of strangulated hernia, and stercoraceous vomiting for twelve days, it was remarked

that "she was far from being so exhausted as the patient, Grace Glover; her voice was hale; her face was not so pale nor so ghastly." Yet, from the history, and the continued vomiting, and from the croaking* within the tumour, there was reason to fear the worst.

Upon making the incision, which was nearly five inches long, over the tumour, the parts were found adhering, and the cellular substance and fascia were soft, and of a dirty yellow colour. The knife seemed to have penetrated, at particular points, into a foul abscess, from which there was an oozing of matter. My friend, having by a little dissection, exposed the parts, the sac and intestine were found entirely gangrenous and broken into one mass, over which the firmer fibres of the superficial fascia crossed like strings, and through which the fæces were forced out. The bistoury was now used, and the intestine freely opened.

A small quantity of fæces only was discharged from the intestines; a little tepid water was thrown into the intestine, but it was not returned. In the evening, there was no further discharge of fæces, nor were the symptoms alleviated. The succeeding day a majority of surgeons overruled Mr. John Bell's objections, and the surgeon introduced his finger into the intestine, and with the

* In a recent hernia, it indicates that the distension of the gut is not great, or that its contents are moving up, but in so late a stage as this, it indicates gangrene.

bistoury divided the edge of the ligament. After this there was a considerable quantity of fæculent matter discharged, but the patient was not relieved; she continued sinking, and died in the evening.

Dissection.

On opening the abdomen much putrid air escaped; the whole intestines, but particularly the small intestines, were very much inflamed, and greatly distended; their colour was dark brown. The ileon was traced into a passage under the Poupart ligament: here the two portions of intestines adhered together, and to the peritoneum. There was a little coagulated blood at the neck of the sac, and a small nick visible from the abdomen, where the bistoury had passed in the second operation.

Observations on the Case.

Authors, in treating of the *bursten* intestine, should have distinguished two cases; the intestine burst by ulceration on the sharp ligament, and the intestine burst after mortification. We have to enquire, whether or not, in such cases, it be necessary to dilate the ring; secondly, in what manner it is to be done; and, finally, how we are to prepare for the re-union of the gut. When the intestine is burst in this manner by gangrene, the opening is to be enlarged, the surgeon then introduces his finger (within the gut), and passing the point under the ligament, he feels if the stric-

ture be free to allow the fæces to pass, and if he can pass in the tip of his little finger, no further operation is necessary.

But if the contents of the intestine be not freely discharged, and if the gut have come through a space so small as to impede the discharge, then the ligament is to be cut. But this ought not to be done by introducing the bistoury on the finger which is within the gut; for then the sound part of the gut is cut, and the abdominal cavity may be opened, which, in this state of parts, is happily closed. The parts must be dissected around the ring or neck of the sac; the edge of the ligament is to be raised without injuring the intestine, and the firm or ligamentous parts only cut; and I have already said, very little cutting will enable the surgeon to pass the finger up the gut, and through the ring or stricture.

I have in this Report given ten cases of femoral hernia, and I have seen many without keeping any account of them, and many in which I saw only the fatal result on dissection. But the question which has been so much agitated about the manner of cutting and sewing the mortified intestine, has never occurred to me in a practical form, unless the first case of this series might be so construed. When there was mortification, there were also adhesions of the gut to the ring and mouth of the sac. That adhesion is not to be undone for the purpose of tying or sewing the sides of the gut together! Here experiments on brutes are

good for nothing, and worse than nonsensical; they mislead.

Nor is the practice, though possible, much better, where the surgeon passes a ligature through the mesentery, to retain the mortified gut from slipping into the abdomen. The manner of accomplishing every indication, is this: having cleared away the mortified portion of the intestine, attend carefully to the two canals which are left, the one leads to the superior, the other to the inferior portion of the intestinal canal. Pass the needle, carrying a seton cord, deep into the one orifice, and bring it out by the other. This will retain the intestine in its place, if that be necessary, and in due time it will form a communication betwixt the two portions, by which the continuity of the canal will be restored.

M. Dupuytren employs a very ingenious manner of restoring the continuity of the gut in cases of anus at the groin; he introduces the leg of a pair of forceps (formed for the purpose) into each orifice or portion of gut; these, being closed, meet at their extremities only, and first hold the portions of the gut together, and by continuing so to keep the instrument shut, by a mechanical contrivance, mortification takes place in the parts thus compressed, and consequently a communication is in the end, established betwixt the two portions of intestine.

This is a very ingenious method, and I have no doubt is practicable. The manner I have offered

is in imitation of the process of Nature, and it is always possible to do it. The instrument is a needle, and at hand: an instrument of so peculiar a form, as that of the French surgeon, will probably not be found when it is wanted.

Those who think, that to praise a man's book is to say he is my friend, and to criticise it is to declare the author is my enemy, will not comprehend how I can exult in the true splendour and usefulness of Mr. Cooper's work, as an honour to the time and the country, and yet object to particular parts. Nevertheless, this is the only just criticism; for where the particular advice is wrong, the general merit makes the passage more dangerous.

In his 12th Case, he spread the sphacelated portion of intestine in his hand, and cut off the mortified portion; after which he made three sutures upon the intestine, to bring its edges together; the intestine was then pushed as near as possible to the mouth of the herniary sac, p. 31. In the 11th Case, two inches and a half of the intestine were cut off, and the ends of the intestine joined by three sutures, so as to leave a small opening for the discharge of fæces. In the 9th Case, he passed a needle and ligature through the mesentery, and fixed it to the mouth of the herniary sac, and then made a large opening into the intestine two hours after, he dilated the stricture, and then the fæces rushed down into the mortified intestine, and were discharged.

If the cut edges of the intestine are to be joined with ligatures, the intestine should be reduced into the abdomen; for to keep it without the ring, must make the passage through the intestine too intricately twisted, to expect the fæces will take the course of the canal, while this operation does not leave a free opening to unload the bowels of their contents outwardly through the groin.

To use a ligature through the mesentery to fix the intestine to the groin, is making no provision for the reunion of the end of the portions of the intestines. The subject will be further illustrated by the following example.

XI. ANUS AT THE GROIN.

In my Collection there is a preparation which illustrates this subject. A middle-aged woman had a tumour in the groin, which was soft, œdematous, and inflamed. From the train of symptoms, it was obvious that this was a herniary tumour: but she would not permit the operation, nor even the approach of a surgeon. In a few days, the tumour burst, and discharged matter and feculence. She lived three weeks from the time we saw her. On dissecting the body, I saw in the labium a bag of matter, and an ulcer, with sinuses in the groin. The portion of the intestine which had been held in the sac was quite sloughed away, and the sac was no longer distin-

guishable. An opening, through which the little finger could be introduced, communicated with the gut, and formed an anus at the groin. On opening the abdomen, two portions of the ileon were seen tending to one point, the passage under the femoral ligament; they were in close contact, and agglutinated as they approached the passage, and adhered to the peritoneum. In the preparation, it is still observable that these two portions of the intestine have one opening towards the groin, which is owing to the wasting of the intermediate septum; and here it appears, that if the opening had been closed outwardly by granulations or adhesions, a communication might still have remained betwixt the two portions of the intestines.

When we look to the preparation, it appears an easy matter to pierce or to destroy that septum by either of the means I have spoken of: but let it be remembered, that when the anus at the groin is thus established, the opening is irregular and deep. Although it may be easy to find the passage by which the fæces came out, it does not follow that the passage to the lower part of the intestine shall be found with the same ease. Here is an additional reason for passing the seton ligature into the extremities of the gut, in preference to passing it through the mesentery at the time of the first operation. The ligature serves to distinguish the two extremities of the gut, and if it do not prove effectual to the formation of a communica-

tion betwixt them, it will facilitate whatever operation may afterwards be attempted. Before this simple means be rejected, let it be remembered that there is a natural tendency of the two portions of the gut to form a communication by ulceration, which appears to me to ensure the enlargement of the hole made by the seton, and its continuance.

[*See further Cases of Inguinal Hernia in future Numbers.*]

SOME OBSERVATIONS ON THE STRUCTURE OF THE PROSTATE GLAND.

By Mr. Shaw, Demonstrator of Anatomy in Windmill Street.

The anatomy and diseases of the prostate gland have long been favourite points of discussion; but of late years they have excited greater interest. For this we are indebted to Sir Everard Home, who, by his book on Diseases of the Prostate, has not only shewn the true principles of practice, but by his description of the morbid anatomy of the gland, has incited surgeons to the further investigation of its natural and morbid structure.

Trusting to Sir Everard Home's love of science, and observing that in most of the papers which he

has given to the public, he seems desirous of bringing forward the younger members of his profession; I have, without fear of appearing presumptuous, given an account of some dissections which I have made of the diseased prostate; in the course of which I have remarked facts which induce me to vary in some points from the usual description of the third lobe.

In the demonstrations of anatomy which I have given for some years to the students in Windmill Street, I have always shewn that part of the prostate, which is called the third lobe; and in not less than 200 dissections which I have made of the bladder, I have never failed to find the same part, by following the description of the dissection, given in Sir Everard Home's book on Diseases of the Prostate. The situation and form of the three distinct portions or lobes of the healthy adult gland are there so accurately described, that were I to describe the parts from the most accurate dissection, it would appear only as a transcript of the passage.

In the Medico-Chirurgical Transactions of 1812, there is an account given by Mr. Bell of the different opinions of the ancient and modern anatomists on the diseases of the prostate; and particularly of that projection of a part of the gland into the bladder, which produces a valvular obstruction to the passage of the urine. In the investigations of this subject, Mr. Bell discovered that the bodies commonly called corpora carnosa,

which proceed from the mouths of the ureters, were small muscles, and that they were inserted by a common tendon into the prostate gland.

In the same paper he gives an ingenious theory, to account for the projection of a particular portion of the prostate into the bladder. In every case which I have examined, of that which is called disease of the third lobe, I have found his idea to be correct; that is to say, the portion of the gland to which the muscles of the ureters are attached, has been the part from which the projecting tumour arose. Though I agree with him in his theory, which I am sure every one who examines his collection in Windmill-street must also do, still there is one part of his essay which I think incorrect. I mean his description of the insertion of the muscles; but before I notice this more particularly, I shall state the circumstances which gave origin to my more immediate investigation of this subject.

About three years ago, I found a diseased bladder, the appearance of which led me to form the idea that the disease of the prostate, which forms a tumour within the bladder, was not always produced by the enlargement of the third lobe; but from the manner in which the preparation was mangled by a young student, who not only divided the pelvis, but also the prostate, with the saw, I was unable to judge accurately of the state of the third lobe; however it was evidently a portion of the gland anterior to the third lobe that projected into the bladder. I preserved the parts, and the prepa-

ration is now in the section of diseased prostates in Mr. Bell's Museum. The next opportunity I had of examining this disease, was in a subject where the projection of a part of the prostate into the bladder was in its first stage. The patient had long laboured under fistula in ano, of a very complicated nature; he was worn out with repeated suppurations, and was at length carried off by diarrhœa. On opening his bladder, I saw the muscles of the ureters particularly strong and very distinct from the other muscular fibres of the bladder; indeed these were not unusually strong. At the point of the prostate to which these muscles were attached, I found a projection of the size of a bean, evidently the commencement of that tumour which has been called disease of the third lobe. I made a careful dissection of all the parts round the neck of the bladder; and on the back part, I made the same dissection as that described by Sir Everard Home, in his description of the third lobe. I removed the vesiculæ seminales and ducts of the testicle, and though there was an evident projection of part of the gland into the inside of the bladder, still that part which is called the third lobe, was as distinct as it is found in a subject the most favorable for the dissection.

There are two points shewn in this preparation. 1. The commencement of a valvular obstruction to the urine, produced by the projection of a part of the prostate into the bladder, which part is anterior to the third lobe. 2. That the muscles of the

ureters are not inserted into the third lobe, but into that part of the prostate which, when diseased, projects into the bladder. In the works of some of the best anatomists, the muscles of the ureters are described as two cartilaginous bodies, running from the mouths of the ureters towards the urethra, and terminating in the caput galinaginis. On a superficial examination, they present very much this appearance; but Mr. Bell has shewn that they are muscular, and that they are attached by a tendinous band to the substance of the prostate. He is incorrect, however, in describing them as attached to the third lobe. This is proved by the preparation I have just described, which is at the same time an example of the truth of his theory, viz. that this particular enlargement is produced by the action of the muscles of the ureters.

I have very lately dissected another diseased prostate, which, though differing very much from the two I have already mentioned, is, notwithstanding, illustrative of the subject. The gland was taken from a man sixty years of age. It is enlarged, the opening of the urethra is of great size, and the bladder does not appear to have suffered from dilatation; there are three distinct projections from the prostate into the bladder, but there is no projection in the usual place: the muscles of the ureters are not increased in strength. On the back part, I perceive the third lobe slightly enlarged, and projecting downwards.

From these dissections, the following conclusions may be drawn :—First, that, in many cases the enlarged portion of the prostate, which projects into the bladder, is not the third lobe, but a more anterior part of the gland.

In the second place, it appears, that where there is a valvular projection into the bladder, the muscles of the ureters are found to be inserted at the root of the tumour.

Thirdly. It appears that whenever there is this valvular projection from the prostate, the muscles of the ureters are found enlarged.

It will perhaps be admitted, as in part a corroboration of what I have stated, that I cannot find in any book the description of a dissection of the back part of the prostate, where there was a valvular projection into the bladder; nor have I seen any drawing of a perpendicular section of the diseased gland, which could give a correct idea of the relation between the third lobe and the portion which projects into the bladder.

OBSERVATIONS ON THE AMPUTATION AT THE SHOULDER JOINT, AND ON THE EXCISION OF THE HEAD OF THE HUMERUS, IN CASES OF GUN-SHOT FRACTURES.

The consideration of such subjects recals to my mind the cases which I have seen in military prac-

tice, and the surgeons whose operations I have witnessed with admiration. The many occasions which I have enjoyed of seeing the military practice, have given me a great interest in whatever regards that department of the profession. Some of the gentlemen of the army and navy, originally well-grounded in the knowledge of their profession, have come forward into notice, and given a reputation to their department of the service: and I hope that our common profession will be still more enriched by communications of the result of their experience during the late wars.

Some will say, that the subjects here treated of belong to the military surgeon. They have poor notions of the profession, who would suggest this distinction. Surgery has been improved in a remarkable manner during the last fifty years, by the lecturers and hospital surgeons. Their efforts have been ably seconded in the practice of the army and navy; and especially in operations, some very bold and remarkable things have been there accomplished. But every hospital surgeon and teacher claims the privilege of examining these operations, and the principles on which the military surgery has been conducted. I have sacrificed much to see our navy and army surgeons on duty, and in doing so, I have shewn my respect for them; but I will not lose the vantage ground which a laborious life has given me, nor yield it to them as a privileged body, to lay down the great

principles of the profession. The patients in military life are not drawn to their surgeons by their reputation—they have no power of selection—misfortune brings them under very absolute practitioners; and this has often struck me as a reason why the army and navy surgeons should confine themselves to rules acknowledged by the general sense of the profession.

After the battle of Corunna, I went to Portsmouth, and lived a short time in Haslar hospital, where I studied, I hope, with all diligence under that excellent surgeon, Mr. Vance. They would joke with me on my picking up the bones shattered by gun-shot, saying these would make fine stories for lecture! These bones were of much use to me; and although, at first, I sought for them simply as the examples of such fractures as the united navy and army surgeons condemned to amputation; gradually, as I saw more into the subject! I began to question the propriety of their decisions.*

I prosecuted the subject in the York hospital, for Mr. Knight was liberal in the discharge of his office. My opinions published, and expressed repeatedly in lecture, were, if possible, more than ever confirmed by what I witnessed of the wounded at Waterloo.

* See the Section of Gun-shot Wounds, in the end of my Operative Surgery also published separately.

I shall confine myself at present to those wounds of the shoulder, which require extraction of the head of the bone, or amputation at the socket.

If the surgeon and his assistant be bold and dexterous, and use dispatch, the OPERATION OF AMPUTATION AT THE SHOULDER JOINT, may be safely performed according to the present method. I saw it done in Haslar hospital, in a manner which left no room for improvement, while committed to such hands. But considering it as an operation often required, and of course, pretty generally performed, it does seem to me, that a plainer and safer mode ought to be laid down. These are subjects which it is dangerous to consider theoretically. Experience leads us to a fuller comprehension of the difficulties; and sometimes, contrary to the general course, the hand leads the head: for, in performance, that is often difficult or awkward, which is plain in words, or easy to be done, though obscure in description.

In my volume of Surgery, I have explained the necessity of supporting the patient, and the manner of doing it. I there stated, that if the patient be not supported at the moment of dividing the artery, when the pressure should be greatest and the resistance most steady, the patient sinks, and the artery is free! I have additional reasons to caution the surgeon against this occurrence.

The compressing of the artery above the clavicle, does not secure the patient against loss of blood.

It may be done, but is not to be depended upon; for if it be, there will be a great loss of blood.

The manner of making the incision has been a great deal too much dwelt upon; for without considering the place and extent of the wound, it is absurd to be critical about the form of the incisions. Generally speaking, the deltoid muscle ought to be made to form the flap; so as to fall down upon the semicircular incision on the lower or inner part. But the flesh of the top of the shoulder is sometimes torn or contused in such a degree as to make this form of incision impossible. Then two lateral semicircular flaps are to be formed. But these must still be accommodated to the form of the original wound, and with a regard to the security of the artery.

In this operation, the compressing and securing of the artery, is the point by much the most important; and it is here that I think our military surgeons err: they disregard the danger too much. After experience acquired, they proceed boldly and with effect, without considering the circumstances of the younger surgeons, or the difficulty as it may present itself to a surgeon on his first operation. But according to the present method, it is not proper to cut the artery across, without security that the blood be arrested; and on the knife dividing the remaining portion of the limb, and the artery with it, there should not, instead of quietness and security, be a general scatter of the assistants and spectators, to avoid the blood. I

think every practical surgeon must have noticed this fact; that the suddenness with which the blood is drawn from the heart, is of more consequence than the quantity. I have seen in common amputation, a few jets of blood direct from the artery, give a shock to the patient from which he did not recover. The blood which flows from the artery in the shoulder-joint operation, comes direct from the heart; and I have seen the moment of the division, the moment of the general sinking of the patient. In unskilful hands it is fearful to think of the consequence of this state of things.

Why, therefore, should not a safer method be taken, if it be as expeditious. I am entitled to speak strongly if I can prove that there is a safer method. It is this: When the incisions have been made above, or on the outer side of the shoulder; pierce the capsule, and separate the head of the bone, so that the thumb sinks into the joint; then grasping the integuments of the axilla with the fingers, the artery itself is in your grasp, and not a drop of blood escapes. When the last cut is made, severing the limb from the body, the artery is cut across; and it is presented with open mouth to the tenaculum or the fingers of the assistant without a drop of blood distilling from it. It is tied with more ease than in a common amputation, and with no occasion for hurry or trepidation.

In the hospital, called Gendarmerie, at Brussels, I had occasion to perform this operation. A mus-

ket ball had struck the head of the humerus, and fractured it, and broken up the acromion scapulæ. Whether this was a proper case for the operation of amputation, we shall presently inquire: but I was employed in disengaging the broken bones when two staff surgeons came in, who induced me to convert the ugly wound which they saw, into an amputation at the joint. The state of the patient admitted of no delay; and, taking the amputation knife, with three motions of the knife I separated the arm.

I stood behind the patient. Setting on the knife in the wound of the top of the shoulder, I drew it so as to make a flap of the outside of the deltoid. Then laying the wounds into one, (in the direction of the dotted line, Plate VI,) I drew the knife a second time in the cut, so as to open the capsule. I then passed the thumb of my left hand into the joint, betwixt the glenoid cavity and the head of the humerus, bending the fingers of the same hand into the axilla, I held the string of the artery and nerves firmly betwixt my fingers and thumb, and completed the operation by a semicircular sweep of the knife on the inside and lower part of the arm. The artery presented its empty mouth. Giving up the knife, I took hold of the artery with my finger and thumb of the right hand, and drew it out clear of the nerves; when it was tied by my assistant.

In this manner of operating, the only thing that can be called a difficulty, is common to both methods of operating—the division of the capsule.

When the upper segment of that membrane is divided, and the arm permitted to hang, there is nothing to prevent the thumb from being thrust betwixt the scapula and humerus. I have done this so often at lecture, without changing the knife, that I found no difficulty in doing it on the above occasion. But as these are bloodless parts, time may be taken, and the probe-pointed-bistoury used to divide the capsule on the outside and inside of the head of the humerus. In the common manner of amputating, the artery being cut across, shrinks, but the gush of blood does not cease; it still issues from the retracted artery, and obscures its place. A great advantage of this manner which I recommend is, that the artery is so held that it cannot retract, but points towards you with open mouth. Now I ask with confidence, Is not this a safer, and therefore a better method, than trusting entirely to the compression of the subclavian artery? For in these circumstances the cry is, now! now! gentlemen, take care of yourselves! is all ready? I am about to cut the artery! and whiss it goes, giving evidence on every spectator, that they have been present at a great and bloody operation.

In a late publication (for it is the fashion not to mention names, unless we are going to cover a friend with extravagant praise), the author, who is considered for many excellent qualities, the example of the army surgeon, says, indeed I prefer feeling

the pulsation of the artery, that I may afterwards be certain that it is properly commanded. He continues, the axillary artery does not throw out so much blood at each pulsation as has been conceived. The blood thus thrown out immediately declares the situation of the artery, and if the judgment be not obscured by the hurry of the moment, very little pressure with the closed hand on the surface of the wound commands the hemorrhage. I will admit this is very good practice when a man is sitting on a pack-saddle, sublime amidst the Pyrenees, where a few jets of blood amidst the surrounding carnage, is a matter of no moment; but I believe my friend will acknowledge, that in a London hospital it would make a very considerable sensation!

In studying these same fractured bones I have spoken of above,* and seeing the consequences of the attempt to preserve the arm in such cases of gun-shot fracture, I concluded that the prolonged mischief was principally owing to the shattered bones being left.

There were two cases of the head of the humerus fractured by musket-shot; one of which I saw condemned to amputation at the shoulder-joint, by a naval surgeon, and the other by an army surgeon. And after this I had many occasions of knowing that such was the practice dur-

* Which are arranged in a cabinet in the Museum.

ing all the peninsular war. In these circumstances I could only make the strongest representations against such practice; and although I thought that my authority might have little weight, I expected that my reasons should have some; and I think I may say that in this I have not been disappointed. But my object is not merely to show that I have pointed out the necessity of these operations, which have been performed since the promulgation of my observations in my lectures and in my book; but to do a thing of somewhat more consequence, to show that they have been done with great negligence of the anatomy.

I saw Ellard, whose case is before the public, and on whom an operation was done in the York hospital. A musket-ball had passed through the head of the os humeri, and shattered it, forming a case exactly similar to that of which I have given a plate in my Surgery. When I saw this man I found that the surgeons in operating, had cut across the deltoid muscle, and separated it from its insertion into the humerus; the consequence of this was, such as might have been anticipated, The head of the bone being extracted, and the connexions of the humerus lost with the scapula, and the deltoid cut across, the pectoralis major and the latissimus dorsi, had drawn the end of the bone

towards the side, the consequence of which was that the bone lay irritating the skin on the inside, and an abscess had formed there.

The operation has been commenced in the same way in a second case, that is, by raising the deltoid muscle in a flap. Besides being wrong in respect to the operations of the muscles on the remaining end of the humerus, this is an unnecessary severity. The cutting across the deltoid muscle and then raising it up as a flap, presents the fractured bone entirely to view; but it makes a very formidable operation. The arm is more than half cut through, and an extensive suppurating surface is produced. To a patient reduced by long suffering this is a serious matter; and in a recent case it is of great advantage to have the operation simple and less frightful in appearance, that it may be the more readily submitted to.

When I first proposed this operation, it was in these words: "now supposing that instead of performing that very serious operation, the amputation at the shoulder joint, a decided and long incision be made through the deltoid muscle, the loose bones picked away, and the broken extremities of the humerus taken off with a small saw, what would the situation of the patient be? The operation is easy, not severe to the patient, and the cause of high inflammation and protracted suffering is removed."

That the operation of extracting the head of

the humerus, as performed in the York hospital*, was set about with very confused notions, is evident from the expression they have used in the report of the case. To remove the bone, " it became necessary to separate the capsular ligament from its connexions with the neck of the bone and contiguous muscles, viz. *teres major*, *pectoralis major*, *latissimus dorsi*, *& subclavius*." However familiar with the term, they ought to have known that the muscles to which this distinction of major is given, have no interference with the capsule of the joint, any more than the *subclavius*. The operation required three quarters of an hour, two arteries were tied, and two pounds of blood were lost. Here is another indication of the severity of the operation, and of the improper manner in which it was planned. On the subject of this operation generally, I have only to add, that if at any time it shall be necessary to make an incision across the arm, the middle portion of the deltoid should be preserved entire, to be a counterpoise to the pectoralis major, or latissimus dorsi †.

* I know that this operation was well done; I have seen the operator do things of greater difficulty. I only criticise the plan of this operation and the *case*, as it appears before the public; had it been the work of one head and two hands, I should not have noticed it.

† It is no apology to say that it may be necessary to cut off

Since the few observations of mine on this subject have stood, as it were, in the way of the reports of the military surgeons, the Baron Larrey is quoted with high consideration. As to the cases of Mr. White and the surgeon of Pezenas, they have no more to do with the question before us, than if it were debated whether those gentlemen used a bistoury in the operation of fistula; and if they be brought forward now with the laudable intention of giving to every one his due, this sort of justice is done with the unfortunate effect of drawing off the young military surgeon from the just knowledge of the case, and obscuring his understanding of the question, in practice.

In regard to M. Larrey, his cases do not go to the point; and his operations were ill performed. In the cases in which he extracted the head of the humerus, the humerus was broken near the head: a case, I imagine, which would do well, conducted on the principles of gun-shot fractures; and instead of performing the operation as it suggested itself to me, in considering the practice of the British army; he simply picks away the bones which are loose, *without completing the operation;*

the arm on discovering the state of the bone; and that therefore a flap must be formed; for the amputation may be done equally well beginning with an incision from the acromion, in the length of the fibres of the deltoid.

and accordingly we find that in all his cases the end of the humerus exfoliated; and what does this convey to the surgeon's mind? abscess, fœtid discharge, and long suffering.

But what truly was the estimate of these operations of *White*, the surgeon of *Pezenas*, and *M. Larrey*, in the British army? our surgeons preferred the formidable operation of amputation at the shoulder joint. "The disapprobation it met with from the medical department of the British army arose, not from any experience of its ill success, but possibly from too great an attachment to the operation of amputation." This is very well from one of themselves, with all the records of the campaign in Spain before him; and the fact is further illustrated by the report of another Surgeon, high in rank, in the Peninsular war; who, after stating that many soldiers, who had unfortunately experienced compound fracture of the shoulder joint, had suffered amputation of the arm, at its articulation, with the scapula, concludes by stating, (and this on the 5th March, 1816) that the case which he has laid before us will shew that such a *dreadful* operation is not *always necessary*.

After reading the portion of my Surgery, which treats of this subject of gun-shot fracture, and those more recent reports of military practice, I think I shall not be denied the agreeable reflection of having roused the army surgeons to a juster notion of

these cases, and of being eventually the cause of saving many a brave fellow's limb.

The Subject to be continued in reference to the Cases of Waterloo.

END OF PART II.

Surgical Observations,

&c. &c.

REPORT.

OF PULMONARY DISEASES IN CONNEXION WITH LOCAL IRRITATION, AND CONSEQUENT UPON WOUNDS AND SURGICAL OPERATIONS.

THERE are certain neutral subjects which stand betwixt the provinces of the physician and surgeon, and which it is to be wished were better cultivated, and their importance explained, to the conviction of our students. The typhus fever, which attacks the surgeon's patient after loss of blood, severe injuries, concussions of the brain, or surgical operations, is a subject very much deserving inquiry. The constitutional derangement which leads to erysipelas and mortification, on slight injuries, is a subject of more difficult investigation, and stands in great obscurity. The matter of this short report does not yield to any in practical im-

portance; viz. the inflammation of the lungs, consequent upon severe wounds and surgical operations. It may be said, that the type of these diseases does not differ from the idiopathic diseases treated of by medical authors. But it will not be denied, that the circumstances attending the attack are peculiar, and the symptoms of the commencement unusually obscure. Thus in a man labouring under the slighter symptoms of concussion, the typhus symptoms encroach before the surgeon is aware. A man scratches his hand, and the erysipelas assumes so formidable a character, that the arm is black and mortified in a few days. A wounded man, reduced by discharge and irritation, and perhaps having suffered amputation, is seized with inflammation of the lungs, the character of symptoms is altered by the patient's condition, and the first stage is passed before the surgeon is aware of the formidable nature of the attack. Feeling at this time the close connexion of this latter subject, with our daily business, I have attempted to illustrate it by a variety of instances.

Most men from their birth have a tendency to disease of certain organs, and those who have it not by parentage, acquire a similar disposition. The organ which is thus subject to disease is vulgarly but truly called the weaker part; for it is as if the balance were destroyed, and as if the burden of any constitutional struggle bore more heavily upon this particular organ. We see this exemplified when there is any feverish irritation prevailing, or

in the breaking up of the constitution. With some, the local disorder excited by the general derangement, shows itself in the brain; with others in the lungs, or in the heart, or in the liver, or in the urinary organs. And if at an earlier period of life any of the principal organs have suffered, though only accidentally, and without constitutional predisposition, they retain a liability to disease, and yield whenever the general health becomes affected from accidental causes.

The lungs are most subject to this latent derangement; they often suffer a certain degree of it, attended with adhesion to the chest, with partial obliterations of part of their spongy structure, or with the formation of small, scattered, and indolent tubercles in their substance, and the patient may live long without suffering from such partial imperfections; besides, independent of all predisposition or previous derangement, when excessive general fever and irritation prevail, the lungs are the most prone to partake of the inflammatory action, and to aggravate the suffering and danger.

I do not imagine that any one will dissent from this statement, or perhaps allow that it is new. All I shall contend for is, that it is very necessary to be remembered in surgical practice; and yet that it is one of the many subjects which authors have neglected to treat of, and one which is most directly and closely connected with a very large range of cases.

A patient shall have a stricture in the urethra, followed by fistula in perineo, and occasional abscesses, and much feverish irritation. He suffers an operation, followed, perhaps necessarily by fever and pain. He is now observed to have a cough and pain in his side; which continues, sometimes better, sometimes worse—further incisions are necessary in the perineum; after which, his disorder of the lungs assumes a very formidable character, and the patient is delivered over to the physician, as now belonging more to his department.

A patient submits to the operation of lithotomy. We shall suppose that the incision has been made high and small; the urine lodges; much irritation arises from this lodgment; bad matter is formed in the pelvis, and by the side of the rectum; in the mean time, about the third week, the patient already worn out, has a catch in his breathing, speaks low from the fear of exerting the chest, his pulse is quick, he has pain in his side, he dies of inflammation in his chest---but the operation is supposed to have nothing to do with this! It is regretted that this unfortunate attack should have come on; he was doing so well! however, the surgeon comforts himself with the reflection, that so far as regards the operation, he had recovered, for he had passed all the usual danger.

When I look back on former cases, I cannot resist the belief, that I have seen patients cut off be-

twixt the third and fifth day after operation, by a more sudden and acute attack of inflammation in the lungs.

How often is the hand restrained from operating on fistula in ano, because the patient having already a cough and morning expectoration, if we do too much, and raise inflammation, constitutional irritation succeeds, and the pulmonary complaint is so much aggravated, that the patient is altogether given over to the physician.

In cancer of the mamma, it is natural to suppose, that the contiguity of the mass of disease to the lungs should be the cause why the patient dies of affection of the chest: but we remark, that cancerous ulceration with great excitement, will destroy its victim in the same way, though remotely situated; which leads me to believe, that it is frequently through constitutional irritation, that the lungs become oppressed in that disease.

But inflammation of the lungs is by far the most frequent cause of death in severe wounds, and especially in compound fracture: of which I shall first give some examples, and then proceed to state how much the subject has been overlooked in the matter of amputation. The following examples I extract from the case book; no doubt the students have similar facts in theirs:---

INFLAMMATION OF THE LUNGS FROM COMPOUND FRACTURE.

Clayton's Ward, 6th June. Here is an old man, whose leg was crushed by a carriage wheel. The bone is shattered. Very large pieces have been taken away; it might have been a question of amputation; that time is past; he is dying of an affection of his chest. How far does this state of respiration proceed from the irritation of the wound?

INFLAMMATION OF THE LUNGS FROM COMPOUND FRACTURE AND INFLAMMATION OF THE BLADDER.

Clayton's Ward, 18th June. This old man had his leg broken by the falling of earth. He has been in the house twelve days, and the fracture has so far done well. Before the accident he had an occasional difficulty of making water. Within these few days it has been necessary to draw off the urine with the catheter; the urine drawn off deposits much mucous sediment. His present complaint is in his chest; he breathes with a short groan, forty in the minute. This pain came on yesterday morning; he has had no shivering. My advice being asked, I gave my opinion; that the fracture had produced constitutional irritation, and increased the affection of the already irritable bladder; that the fever thus

aggravated, the lungs had become consequently affected. The bladder was emptied; he had an opiate clyster, a mucilaginous mixture, with antimonials, and a blister applied to the breast. He died on Wednesday evening. The bladder was empty; and portions of coagulable lymph were hanging from its inside. Both kidneys were compressed, and their bodies wasted. There were tubercles in the liver and spleen. The lungs of the right side were found in a state of active inflammation.

If the reader turns to page 117, he will find an example of inflammation of the bladder ending in inflammation of the lungs; and I think I have seen the patients with diseases in the urinary organs as often cut off by inflammation or suppuration in the lungs, as by effusion on the brain.

INFLAMMATION OF THE LUNGS FROM COMPOUND FRACTURE.

Saturday, 4th January. A coal heaver in delivering a sack of coals from his waggon, by the motion of the horses was thrown betwixt the body of the waggon and the wheel when in motion. The tibia had been ricketty and curved, so that two parts of the arch of the bone were broken, and the integuments were torn off the face of the bone. There was at first considerable bleeding from betwixt the ends of the

fractured bones, and from the saphena vein. I was of opinion that this man's leg should be saved. He died on the morning of the 17th. There was no tumefaction, or erysipelatous sloughing of the skin; but he had delicate lungs, and was suffering from a chronic attack of inflammation and cough at the time of the accident. We might expect that a patient laid down perfectly still, preserved low and tranquil, his bowels kept regular, and his cough allayed by proper medicines, would be relieved of his old complaint. On the contrary; you see here that the pulmonary disturbance increased, and he is dead in consequence of disorder in his chest.

The dissection, however, shewed something more than usual, an aneurism of the descending aorta, which had wasted the dorsal vertebræ; the lungs, considerably pressed by the tumour of the aneurism, were at the same time inflamed and universally adhering.

INFLAMMATION OF THE LUNGS FROM COMPOUND FRACTURE.

Admitted *May* 21*st*, — *Chapman*, aged 60, a hackney coachman. The wheel of his coach falling suddenly into a hole in the pavement, he was jolted from the box, and the wheel went over his leg. There was a compound fracture of the right tibia; the integuments were largely opened, and the bones shattered. Portions of the bone were

extracted; the limb was placed in junks, and the wound lightly dressed, and covered with the cold lotion.

23d. Finding him hot, with thirst, and a frequent pulse, I ordered the bandage to be thrown loose; the leg was swollen; the inflammation of a bad character, being dark red, disappearing on pressure, and the discharge profuse and offensive.

24th. Last night he was delirious; the pulse quick and small; the face flushed, and a dark inflammation spreading on the leg, these symptoms continued their unfavourable course until the 27th, when he was seized with a pain in the side, and cough. On the 28th he was more restless, with great difficulty of breathing; this symptom continued increasing till the 30th, when he died. The last note upon the case book is to the following effect. "He is dying of inflammation of the chest —how far has his state of respiration relation to the wound?"

The first case of the Series in illustration of the question of Amputation, is an example to the present purpose: there are two other cases in the same report, which would go far of themselves to prove the connexion of disease of the lungs, first, with the irritation from compound fracture, and afterwards, from an exfoliating bone of the stump.

INFLAMMATION OF THE LUNGS FROM COMPOUND FRACTURE.

Percy's Ward.---Robert Hedger, 25 years of age. Friday, 10th January. This young man had fallen from a height of two stories; he was shaken, and complained of his back, and had a degree of weakness in his legs during the first day; the right elbow was laid open, and the olecranon broken off. The pain in his back being great, there was some apprehension of an injury to the spine; the chief attention was paid to this, and a dozen leeches were repeatedly applied. As he was restless, a splint was put on the fore part of the elbow joint, and the wound was brought together by adhesive strap, and the cold spirituous lotion applied from the shoulder to the fingers.

For the first few days there was a wildness observable in this patient's countenance and manner, his pulse being about 116. On the 14th difficulty of breathing began. On the 15th the arm had become very much swollen; the face was flushed; the difficulty of breathing was much increased. On the 17th the arm was still more swelled, and tense, and in great pain; his tongue had a brown fur; his countenance was expressive of great anxiety.

Saturday, 18*th*. Great apprehensions are entertained of the inflammation of the chest cutting him off. He has no pain either of the back or arm; the pulse is 140. He complains of great

weakness; there is a distinct spot of redness on his cheek; the skin is hot; he breathes with difficulty; his speech is cut: yesterday he spoke to me in a hale strong voice; he speaks now in a whisper. At intervals and by sudden exertion you may hear the force of his voice, but it is cut, and there is a panting rather than breathing, accompanied with acute pain in the bottom of his chest.

20th. Considerable hemorrhage took place yesterday from the wound in the arm; the pain in the chest has been distinctly indicative of inflammation; but it reaches down upon the belly, and now seems more in the seat of the stomach. He died on the 21st.

Blood was found widely effused betwixt the peritoneum and muscles; and a considerable quantity lay under the peritoneal covering of the bladder, and also of the stomach. The spine was entire. There was inflammation of the right kidney. The lungs appeared little inflamed on their upper surface; but on turning up the superior lobe on the left side, the surface was covered with coagulable lymph and pus; and on the same side there was a large irregular tubercle in a state of suppuration. The lungs of the right side were more generally inflamed, and the surface of the inferior lobe was completely covered with lymph and purulency; there was a considerable quantity of water in the pericardium.

This case is throughout of a common character.

We find the lungs thus rapidly running into inflammation from a severe injury of another part; for it is observable in this case, that the breathing was not at first affected, but only in the progress of the fever and irritation. It is also worthy of notice, that the more general the injury is, the more prone are the lungs to sympathize. The same consequence we find sometimes to result from operations; as from high amputations, the extirpation of large tumours, or the operation of lithotomy. I took off a large scirrhous mamma from a lady in Lincolnshire; the wound healed by the first intention, and only a small part remained open when she died; for being attacked with pain in her chest the second day from the operation, she was cut off by an acute inflammation of the lungs. I was not conscious of there being more exposure in this case than in others; yet the possibility of the exposure having inflamed the lungs, has made me ever since very solicitous to have the body covered with flannel during this operation; and the chest as little exposed as possible. But as these acute attacks are more observable, and as it is the insidious attack of disease in the lungs in a reduced constitution, and with a rankling wound, against which I wish to guard, I shall now present the example of gunshot wound bringing on disease of the lungs, or rapidly developing a pre-existing tendency.

DISEASE EXCITED IN THE LUNGS, BY THE IRRITATION OF OLD GUN-SHOT FRACTURES.

Being on a visit in the country, I was requested to see Lieutenant T. who had received a musket shot in the pelvis. The ball was lodged, and could not be found. In making the attack against the outworks before Thoulouse, the enemy being in front and flank, he received a ball in the left groin; he could not be certain, but he thought that he was wounded from a breast-work in front. He was knocked down, but continued sensible, and in some measure stemmed the blood by pressing his hand upon the wound. He lay on the ground bleeding from mid-day till the evening, when he was carried off the field. Before he received the wound he was in perfect health and strength, and conceived that the great loss of blood he sustained upon the field had reduced him to his present condition. On being deposited in the hospital he was seized with shivering, which he describes as a violent and general shaking, accompanied with intense thirst. When the wound was examined, the surgeon found the passage oblique, and desisted from searching. The ball has never been felt, and is supposed to be lodged in the muscles of the hips.

I made an examination of the wound, and by bending the probe so as to go round the origin of the rectus femoris, introduced it four inches, and

discovered the ball to be lodged in the bone. I saw that the state of his wound was keeping up irritation on his lungs, but I comforted him by saying, that if, when he had recovered strength, he would come to town, I might perhaps extract the ball.

December 16th. He came to town, but in a situation the most deplorable; hectic, and sinking in consumption, with difficulty of breathing, a short cough, and purulent expectoration. I examined the wound; I could still, at the distance of nearly three months from the former examination, distinguish the ball, and around it a portion of dead bone. The examination increased the fever and cough: by further trials, I found this not accidental, but arising from a sympathy, as it is called, betwixt the wound and the lungs. I saw, that if I attempted any formidable operation of extraction, I should lose him by exciting inflammation of the lungs, and that if I extracted the ball, the diseased bone would still remain a constant source of irritation. In addition to his other miseries, this deserving young gentleman was very poor, but on a representation being made to Lord Palmerston, he received an additional sum of £90. and was enabled to live a few months longer, at least in circumstances of comfort: he died consumptive.

I have repeatedly seen the wounded soldier die by sudden aggravation of his wound, as, in the cases I have detailed of compound fracture. When

men have been dismissed on a pension, their wounds indolent, but not closed, being left to their own ignorance uncontrouled, they live in pot-houses, or travel the country in a state of drunkenness, until the wound, being excited to disordered action, and having a spoiled bone within, it becomes sloughy, and sends forth spongy granulations. Then follow all the evil consequences, as in the first stage of a wound with fractured bone; for the lungs partake of the morbid excitement. The men are seized with pain in the side; their voice is cut; spasms about the neck and lips and nostrils indicate the nature and seat of the disease, and that in a state of body already reduced, they are carried off by inflammation of the lungs.

INFLAMMATION OF THE LUNGS AFTER AMPUTATION.

My pupils, who have returned from service in the army, having contemplated a part only of this great subject, and considered it chiefly as referable to the operation of amputation; have received a very erroneous impression, for they have believed the lungs to be affected from the system being unable to accommodate itself to the loss of the limb. The simple fact, that patients die of inflammation of the lungs, after amputation in cases of gun-shot wounds, is most important; but coupled with this

bit of theory, it leads us off from the right line of inquiry, and we seek to account for the disorder of the lungs, which is a consequence of irritation and bad action in the wound, by supposing that the amputation of the member is necessary to the effect. So far from this being the case, if a patient have suffered much by gun-shot fracture, just as in the cases of compound fracture, on any sudden action being stirred up, the lungs will become inflamed ; and if in this state of suffering the patient have the limb amputated, it has the same effect, being an additional cause of disturbance following the long irritation. Thus amputation may excite the lungs through the fever of the constitution ; but so would any severe operation ; as that of the extracting of the ball in a system already reduced and irritable ; this I apprehend to be the reason, why amputation on the field, is not attended with that danger to the lungs, which accompanies the operation at a later period.

If the inflammation of the lungs were a consequence of the sudden loss of a limb ; the amputation soon after the wound has been received, would be most frequently followed with such inflammation : but as this is not the fact, and as such dangerous attacks follow the amputation only when the extensive suppuration has already influenced the system, or the wound has become, like the compound fracture, a source of irritation, then it accords with our uniform experience, viz. that if an inflammatory action be at this time stirred up,

the lungs may become inflamed, and the general disorder thus aggravated, the patient will be lost*.

On reviewing this subject it will be apparent, that injuries to the frame, whether the effect of wounds or of surgical operations, by exciting a high state of irritation, tend to disorder the lungs; and that especially if there be any tendency to disease in this organ, however latent before the injury, it will be developed; and increasing the constitutional disturbance, endanger the patient's life. It also appears, that as wounds, by their sudden and more violent inflammation, produce a corresponding acute attack on the lungs: so do they often by more gradual influence bring on a phthisis†.

When a man has received a severe wound, and the inflammation changes to a dark colour, with gleety discharge, and he becomes restless and irritable, with a quick pulse; if, when in this state, he be seized with a pain in his side, he is in extreme danger; and if this attack be not guarded against, he will have difficulty of respiration; he

* Of which there are two examples at this time in the house; one is a coachman, who, having suffered amputation after a compound fracture of the leg, is spitting matter, and has had hæmorrhage from the lungs. He is considered to be lost. The other is a young man who has suffered high amputation of the arm, and has just recovered from an acute attack of inflammation in his chest; under the care of Mr. Joberns.

† The connexion betwixt sores, as ulcers of the legs, &c. and diseases of the lungs, is a subject of considerable interest.

will not dare to push his voice; we shall find that he speaks quick and in a whisper; he pants like an over-driven sheep; the muscles of his chest and neck are in continual exertion, and his nostrils are expanded, and his lips tremble.

If his weak and feverish state conceal this inflammatory attack, or render the practice necessarily feeble; if with this inflammation in the lungs, the previous exhaustion of the patient, or the influence of the hospital have reduced the powers of the body, he will die: and on dissection the lungs will exhibit the marks of recent inflammation, coagulable lymph exuded, purulency on the surface of the lungs or in the bronchi, and congestion or abscess in their substance. How often are we inclined to say that the patient who dies after a great operation, has fallen a victim to abscess in the lungs, without duly considering how much the stimulus of the knife has to do in exciting this mischief? A knowledge of this connexion betwixt wounds and the state of respiration, will make us careful to defer all operations when any tendency to disease prevails: and if this be not possible, it will make us watchful of the first symptoms, and active in our practice.

Whilst the dissections prove the necessity of the most active remedies to subdue the inflammation of the lungs; the consideration of how much depends on the wound, will make us desist from all irritating applications at such a juncture, and seek to sooth and relieve the local inflammation.

In these observations I have sought to establish my facts by the surer method of anatomy, which, on reperusing the cases, I find gives a very fatal character to this inflammatory attack upon the chest. Yet I will not introduce examples of the cure of such attacks, to vindicate our practice at the hazard of weakening the impression which I hope I have made on my readers*.

REPORT,

CONTAINING OBSERVATIONS ON THE LIGATURE OF ARTERIES, AND SOME EXAMPLES OF WOUNDED ARTERIES.

THERE is no remark more common among young surgeons, than that the operations on the arteries have been exceedingly improved of late. In this I cordially join, provided that the term, "of late," be understood to embrace a larger portion of time than they are thinking of, by at least fifteen or twenty years. Within these very few years a number of ingenious trifles have been offered as improvements, in our mode of operating; and which disturbing the minds of some of our

* Several cases in the present number will prove to be a further illustration of what is treated of in this report.

old and experienced surgeons, have made them hesitate, when tying an artery, to apply a good strong ligature after the old fashion, although they have had experience of its sufficiency for forty or fifty years of their lives!

I was taught carefully to avoid drawing a ligature so tight around an artery as to cut the inner coats; and this remark was repeated both in the dissecting room and the hospital. And in my earliest experience, I knew that if in preparing for my injections, I tied the arteries too firmly where I meant to stop the course of the wax, I should produce extravasation there, and lose my labour. It is plain, therefore, what I must have thought of the discovery, that when a ligature is put around an artery, the inner coat is cut; and I confess that I could not have imagined to what an absurd length the opinion would be carried by practical surgeons, as if in emulation of the experiments of young men preparing for their thesis, where indeed ingenuity is most commendable. The surgeon ought never to consider himself at liberty to deviate from a line of practice which experience has proved to be effectual and safe. But many have adopted the opinion, that the operation of a ligature on an artery, is to bring the surface into the state of an incised wound. It is curious to observe the length to which this single expression has misled some men. They have never stopt to inquire whether it be true, or whether

they were seeking a false analogy in illustration of the operation of a ligature upon an artery.

When it was discovered that the ligature cut the inner coat of an artery, and when it was concluded that this cutting of the coat was necessary to the closing of the vessel, an experiment was invented to crown all, and fix the matter beyond dispute. A ligature was put around an artery and drawn tight, the ligature was immediately taken off the artery; notwithstanding which the vessel was finally closed and obliterated. Here was the triumph of philosophy and experiment! What was next to be done, I anticipated; and in speaking to my class, I said the next thing they should see, would be a surgeon tying the artery of an aneurismal limb in this manner, so as to cut the coats, and taking off the ligature. It was done that winter. But as it did not succeed in curing the aneurism, the medical world heard nothing of it.

To correct this erroneous, because partial view of the subject, I made the following simple experiment. I put a cord around the carotid of a dog, without drawing it. The ligature lay in contact with the coats of the artery, but did not press upon them, nor interrupt the flow of blood through them. I was certain of the result; a clot formed where the artery was irritated by the presence of the ligature, and the vessel was obstructed at that part. The fig. 2. plate V. is from a preparation, which exhibits the effect of a similar experiment

made by Mr. Shaw, on the carotid of an ass. The ligature lies quite loose, never was drawn, consequently never cut the coats of the artery; an *incised* wound therefore could not have been made here, nor could the blood be mechanically obstructed by the ligature; yet the artery is obstructed, the effect of the ligature is perfect.

After this experiment I should be as fully authorized to commit the folly of using a ligature to the artery of an aneurismal limb, thus simply putting it round the vessel without tying it, as they who propose to effect the same purpose by cutting the coats of the vessel with the ligature, and taking it off again.

By observing what is essential to the operation of a ligature on an artery, we may learn to weigh the value of these new contrivances, of which I shall presently take notice.

1. The ligature obstructs the blood in the orifice of the artery: for which purpose it should be round and strong, and drawn with sufficient firmness to interrupt the blood in its course, and to indent itself in the coats. If it be small, a single waxed thread, it cuts the coats, and leaves only the outer coat to restrain the bleeding. If it be too large, then it cannot be drawn with sufficient accuracy to stop the course of the blood, it remains a loose ring about the artery, and may be removed by the pulsation.

2. Too much has been said of the form of a ligature; if it could be applied flat around the ves-

sel it would be well to do it; but although the five or six threads are laid out and waxed, so as to be flat as a piece of tape, yet when they embrace even the largest artery, and are tied, they are twisted and become a round cord; so that, all that is necessary in making a ligature, is to see that the threads are equally laid, and of course that the ligature be sufficiently strong.

3. In the application of a ligature, care is to be taken that it surround the artery in contact with its coats in all its circle; for if cellular membrane, nerve, and vein, be included, then the artery is not inflamed by the pressure and contact of the ligature; so the substance included may waste, and the ligature lose its hold, before those changes have been wrought upon the artery, which are to prevent hæmorrhage, when the ligature shall be removed.

4. Behind the ligature a *clot* is formed, which plugs the artery. This clot is formed by the coagulation of the blood, which is left stagnant betwixt the ligature and the last branch given off by the vessel tied. It is therefore longer or shorter, according to the distance of the last branch from the part tied. In the examples which are given in the plate, the plug varies from an inch and a half in length to the twelfth part of an inch; and where the plug is of smallest extent, a considerable branch of the artery may be seen going off behind the ligature. P. V. fig. 1. B.

5. But the operation of the ligature is not merely

to cause coagulation of the blood, and the formation of a plug; but a mass of coagulable lymph is thrown out by the irritated and inflamed artery. The formation of the coagulable lymph is of the greatest consequence to the final union of the coats of the vessel.

6. The final closing of the artery, and its loss of function, is attended with a degeneration of the coats of the artery into the common cellular texture. For it is remarkable, that the exercise of the coats of an artery is necessary to their retaining their peculiar character; when an inch or two inches of an artery tied, extends beyond the last branch, it loses its office; it loses the stimulus to its perfection, and degenerates into a loose substance, which we no longer recognise as the artery.

There are thus four changes. 1. The obstruction of the artery by the ligature. 2. The formation of a clot behind the ligature. 3. The discharge of coagulable lymph by the inflamed coats, and the adhesion of these coats. 4. The final change by which these coats degenerate into a common texture. All these changes are exhibited in the plate, and the examples are taken from the human subject.

Keeping always to the views of practice, we may next consider the causes of *secondary hæmorrhage*, that is, the bleeding, which is a consequence of the artery giving way at the place where it is tied.

And first, we observe that the ligature acts mechanically, obstructing the flow of blood; and in a

manner quite different, viz. by irritating the coats to inflammation, and thus ultimately closing the vessel by a process of life. The vessel tied yields under the pulsation in one or two ways, by ulceration, and by sloughing and bursting. If an artery be very much insulated from the surrounding cellular membrane, the vessels which enter its coats are cut off, and where the artery is tied, it dies. Although the clot should form here, the third process (that of furnishing coagulable lymph) is not performed, and the pulsation continuing, and the coats becoming weaker where they are embraced by the ligature, they give way. This is the sloughing of the artery; it bursts as a dead artery. But it may also give way by a process of life, that is, by ulceration. The ligature, instead of exciting the coats to what is called, in the present language of surgery, the adhesive inflammation, irritates to ulceration; and the coats incessantly beating against the ligature, ulcerate and burst, and appear on dissection as if cut across by the ligature.

The rupture by sloughing will be prevented by taking care that the coats are not too much insulated, and that the ligature is applied as high as the circumstances will admit.

The bursting by ulceration may depend on circumstances not so easily provided against; on the state of the artery; for the coats are sometimes diseased and crisp by concretions which form in them, and if they bear the first operation of the

ligature, they cannot go through the process of inflammation to the furnishing coagulable lymph and adhesion, but ulcerate. The ulceration may depend on the constitution, for here, as in other parts, by disorders of constitution, when we expect adhesion, we find suppuration and ulceration. The ulceration of the artery may be occasioned by the state of the wound. There may have been too much dissection, and too extensive a wound; the parts may have been kept too long exposed, and too much handled; or many ligatures may have been used in the wound; all which lead to unkindly suppuration, instead of adhesion. And this state of the wound generally, may be propagated to the artery, so as to interfere with the process of health, and cause ulceration instead of adhesion.

This last consideration brings us to distinguish betwixt the effects of ligatures on the arteries of brutes and on those of man; betwixt the accidents attending the tying of the arteries in youth and health, or in old age and disease. It leads us to distinguish betwixt the ligature applied to the artery of a stump and to the artery, of an aneurismal limb. Unless all these circumstances be carefully weighed, we shall be led into practice which we shall regret, and this, by following novelties, suggested by a desire of distinction; a motive not to be condemned nor checked, but carefully watched and managed, lest the same spring, which gives us force, misdirect our aim.

The principal improvement in the estimation of some surgeons is the employment of very small ligatures, or single waxed silk threads, for tying the larger arteries. This practice has arisen from the idea that they cut the artery more effectually, and, occupying less space, do not so much prevent the adhesion of the wound, as the larger ligatures.

I have shewn that this incision is not necessary to the closing of an artery. In a slight degree this bruised wound may be of advantage, but if the inner coats be cut, and only the tendinous coat, or perhaps only the cellular sheath, be left entire, then more danger than advantage will accrue by the use of a fine and strong thread, drawn tight around an artery. As to the size of a ligature, it does surprise me that those who have written on this subject have seemed ignorant of the advantage of a larger ligature, or have neglected to state the manner of using it.

If I put a ligature of five threads about the femoral artery after amputation, I know that by its presence, touching the coats of the vessel in the whole circle, it will cause a clot to form in the extremity of the artery, and further it will inflame the coats, so as to cause them to throw out coagulable lymph, while it offers a softer or broader edge to the arterial pulsation. Having tied the artery, I plait or twist the ligature, which reduces it to a firm cord, and prevents the threads from being entangled in the granulations; indeed

I cannot blame those, who omit to do this, trying to find some better method of tying an artery.

In a large wound, or on the face of a stump, there are smaller arteries which require to be secured, yet if the ligatures be upon them for a few hours, it will be sufficient. These ligatures, on the lesser arteries, should be taken away on the first dressing of the wound; and only those left, which embrace the important arteries. This facilitates the healing of the wound; and when to this is joined the attention to twist the larger ligature, and reduce it to a small round cord, the interference of the ligature with the adhesion is very trifling, if it prevent it in any degree.

When the ligature, about the larger artery, is twisted, as I have just described, it is in a state to be removed with great facility. And here I am surprised to find authors speaking of pulling, or drawing, or tugging at a ligature, which is a very clumsy manner of bringing it away; and, indeed, it should not surprise us (when we turn to the plate which represents the tied arteries) to find, that sometimes there should come a full jet of arterial blood, when a ligature is thus rudely pulled away. When a ligature is to be brought away, it should be twisted and laid down under the dressing, so as to be preserved thus twisted, and the next day it may be twisted more, but never pulled.

It will now be seen, that a ligature of a few threads is necessary to this operation of twisting;

and the twisting a ligature is so much the better way of bringing it off, that this is an advantage not to be parted with, without a very sufficient reason.

With regard to the practice which has prevailed with some of our army surgeons, of cutting the ligatures off close by the knot, and healing the flap over them, I apprehend the case is not made out; that is to say, the occasion of varying the mode of practice is not made out; since, I believe, that with proper care in arranging the ligatures, as above, the final union of the stump will be as quick as if there were no ligatures at all.—In short, two observations naturally occur on this practice; that it is a wanton and needless variety in the mode of using the ligature, since circumstances do not call for such inventions in amputation; and, in the next place, it promises to be attended with disadvantage, since a foreign body is left in contact with the extremity of a nerve, the nerve and artery being, in general, nearly in contact: and when I reflect how small a portion of bone, being loose, will cause the cicatrix of the stump to open again, I must believe, that the ligatures left on four or five arteries, perhaps more, must occasion the opening of the stump into ulceration. Of how much consequence it is in many situations on service to have the skin whole, I need not enlarge; and the ulceration which is, at first, a mere speck, will, in certain states of the constitution, spread and em-

brace the whole extremity of the stump.—Let me further suppose, that this practice were no longer reserved for the hands of such dexterous surgeons as first put it in use; but extensively employed by the younger, less dexterous, or less experienced surgeons:—should we not then, as now, have a nerve sometimes engaged in the ligature? In our present practice this may be remedied; but it would, indeed, be a serious accident if it occurred to a patient who had the ligature cut off, and the nerve and nooze around it deep buried in the healing stump. I have heard of two cases where the patients returned complaining of an exquisite degree of sensibility in their stumps, although they were some time healed; and a friend of mine, a Deputy Inspector, has informed me, that, in some instances, the ligatures were afterwards discharged by abscesses on the face of the stump.

WOUND OF THE HUMERAL ARTERY.

September 15.—A shoemaker having some difference with his wife, and being intoxicated, struck her; on which her son, by a former husband, and who was sitting at work, attacked him with his knife:—it had an oblique, sharp point, like those used in his trade. This man is 48 years of age, remarkably muscular, and of a manly countenance, but lean and pale. He is cut under

the right ear, and on the left wrist; he has received a stab on the outside of the insertion of the deltoides of the right arm; and, lastly, the knife has entered on the fore and outer part of the biceps muscle of the same arm. It appears that he was behind and struggling with the young man who stabbed him, and that the blow was given backwards over the shoulder.

The runners who brought him into the hospital said, that he had lost a pailfull of blood; a sudden jet of blood had been thrown out of the wound after he was brought into the house; the tourniquet was about the arm. He was, therefore, disposed for operation; for, judging from the direction of the wound, the great loss of blood, and this last jet, notwithstanding the extreme feebleness, we concluded that the trunk of the brachial artery was wounded.

The wound was enlarged, and the tourniquet unscrewed; no blood came from the wound. The man was told to exert his arm, but he had no power in it. The thumb was pressed below the supposed place of the wound, and in the track of the artery*; but it did not make the blood flow. A fomentation-cloth was put upon the fore-arm—it was grateful to him; but the artery could not be made to bleed. The patient was put to bed; a tourniquet being put loose about the arm.

Not satisfied that the patient was in a state of safety, in half an hour I returned to the hospital. I found that, in coughing, arterial blood had been

thrown from the wound. My colleague presently came in.

The wound of the integuments was enlarged; the coagulum scooped out; and the cavity sponged. And it was remarkable that a wound, which was so small, that it would not admit the finger, now exhibited a large, dark, and ragged cavity. It appeared to me, that the knife had divided the portion of the biceps muscle, which belongs to the shorter head, in the moment of exertion; and that the portions divided retracting, left a chasm. The driving of the blood must account for the irregularity and darkness of the sides of the cavity**.

In seeking for the artery, upon the strictest calculation of its place, it was not to be found. It was natural to look for the fascia, and slit it up; but there was no visible fascia. It was necessary to undo the tourniquet, that a jet of blood might disclose the place of the artery; but no blood flowed, nor was there any pulsation to be felt in the wound. A little consideration explained this intricacy; the knife had entered behind the artery, and the chasm was consequently formed betwixt the vessels and the brachialis internus muscle and the coraco-brachialis. The artery was consequently pushed up, and lay on the inside, under the integuments.

The median nerve being raised and held aside, the artery appeared beneath, and a blunt needle was passed under it. During the operation, the

patient, being still intoxicated, roared and struggled with all his might, which had the effect of raising the pulse; and then the artery was felt beating in the bottom of the wound, and a jet of blood pointed out the place of the wound in it. The operator then forcing his finger under the string of vessels and nerves, the artery was seen to be nearly divided in a direction corresponding with the original wound of the integuments. This was satisfactory; the nerve was drawn aside by the blunt hook, and the aneurismal needle was passed under the artery; the ligature was drawn through and cut: one half was tied above the wound of the artery, and the other below.

The wound was brought together, and covered with a piece of dressing, and light bandage of linen.

After Treatment.

Evening. No oozing; the dressings are dry; the pulse is faintly to be distinguished at the wrist. He is more composed.

Morning visit. The patient's lips have their natural colour; there is stiffness about the wound; the arm has its natural warmth. The bandage which was put about the wound has been cut off, and a cold lotion applied over the dressings. In my opinion this man is quite safe; and my only uneasiness arises from his cough.

18*th*. Yesterday a brownish redness was per-

ceived on the elbow, and on the inside of the fore arm. It has increased this morning; matter is already formed, and can be pressed from the lower part of the fore arm. The wound is dressed very lightly to let the matter escape. The pulse is no longer to be felt at the wrist, which, however, I apprehend, is more owing to a slight effusion which obscures the artery, than to diminished force of circulation; at least, the heat of the hand has considerably increased since yesterday.

19*th*. The pulse intermits very remarkably—yesterday every fifth beat, to-day every fifteenth. The back of the arm is œdematous, and of a yellow colour; and, on the inside, there are two black spots of mortification. There is considerable œdema. The hand is quite warm; tepid fomentations, with spirits, are ordered; and a poultice is put on the wound.

20*th*. His countenance is worse; it is pale, and his features are sunk; the pulse is quicker and smaller, and still intermits; the tongue is, however, cleaner; the arm is more swollen towards the shoulder; the black patches, on the fore arm, are larger. *Evening*.—He is highly delirious.

21*st*. The arm is much swollen, and lies a flat mass; the mortified spots have extended; mortification is beginning on the outside, above the elbow—it has begun by vesications. Fomentations are applied, and a poultice is on the wound. The countenance, tongue, and pulse, are rather better.

23*rd*. The arm now looks very ill. The slough of the fore arm extends, and shows itself also on the back part, and towards the wound.

℞ Pulvis Cinchonæ ℈i. Pulv. R. Serpentariæ gr. x. Decoct. Cinchonæ ℥iss. M. ft. haustus 4tis horis sumendus.

26th. The mortification extends to the armpit; and, now, the different patches of mortified skin, on the fore arm, communicate. He is weakened by purging; the pulse is weaker; the countenance more sunk. Continue the wine, and add brandy to his gruel. Adde Haust. Cinchonæ. tinct. Catechu ʒi tinct. opii. gtt. v.

29*th*. This man still lives; and, I think, may yet recover. A great portion of the sloughing integuments have separated, and there is good suppuration on the edges of the integuments. The swelling has subsided, and there is sufficient heat in the whole limb. It is necessary to shift his position in bed, for an abscess has formed in the axilla, in connexion with the wound, favoured by the gravitation.

He is in a precarious condition. Two or three purging stools may suddenly carry him off; or, perhaps, we shall see the suppuration suppressed, and the arm shrunk and dry. As long as the suppuration is good, I do not despair.

30*th*. The ligatures came away with the dressings.

Oct. 8*th*. This man's condition has been mending for some days past. The arm is small; the surfaces, exposed by mortification, granulate and heal; the discharge is good, and not too copious.

But his lungs are affected, and he has pain in his breast, which has made it necessary to apply a blister. He spits a porringer of matter during the night; the pulse is full, and there is less frequent intermission. First, the brandy in his gruel has been taken from him; then the wine has been left off; and, lastly, the bark has been omitted: but still the pulse rises in strength and fulness.

10*th*. A hæmorrhage suddenly took place yesterday. On taking off the compress, which was applied by the house surgeon, the blood comes from the hollow of the fore arm, six inches below the part where the artery was tied. The blood spouts out in a large stream; but feebly, and without pulsation. It has been very easy to stem the bleeding by a piece of sponge and roller.

As the external veins of the fore-arm are destroyed by the mortification, can it be the deep veins which accompany the artery that furnish this blood? It does not come from the brachial artery, but from the depth of the fore-arm.

If the hæmorrhage return, the arm is not in a condition to admit making search for arteries, and amputation must be the only resource.

11*th*. This man is better in an extraordinary degree.

12*th*. Still all goes well. In the evening called from lecture, on account of hœmorrhage; find the surgeon of the week prepared to amputate, but there is no bleeding, and the operation is deferred.

13*th*. At two o'clock this morning I was called to this man. I found the house-surgeon com-

manding the hæmorrhage by pressing on the subclavian artery; for although the bleeding was from the fore-arm, he could not think of applying the tourniquet, as the arm was in a state of ulceration and abscess from the wrist to the shoulder. I, notwithstanding, applied the tourniquet, and indeed the insensibility of the patient removed the objection on account of pain; and now observing the condition of this man who had just strength to raise himself into a temporary energy, and to forbid the surgeon cutting off the arm, we determined to wait and see whether he should rally or sink. He died in about a quarter of an hour.

Dissection.

Upon injecting the arm from the subclavian artery, the wax came out from the sloughy spot below the bend of the arm; and being further urged, it burst out from the brachial artery at the place of the lower ligature.

On dissection, an ulcerated hole was found at once opening the brachial artery at its termination, and the ulnar and radial arteries.

On dissecting the brachial artery, the places where the ligature had been applied, were not distinguishable but for the stopping of the wax injection; singular as it may appear, I should not have imagined the continuity of the vessel could have been destroyed, had I not seen the trunk tied, and seen the ligatures come away; had I not, I may say, seen the artery thus cut through at two places.

The collateral arteries which took the office of supplying the arm with blood were principally the long descending branch of the profunda humeri, which inosculated largely with the anastomoticus major, and with the recurrent branches of the radial and ulnar arteries.

A large abscess was in the axilla, and extended on the side of the chest and under the clavicle.

A purulent and mucous secretion bedewed the trachea and bronchi; but the substance of the lungs was free from disease.

And now, in reviewing this case, you will perceive the complicated manner in which the subjects of your studies present themselves in actual practice. This is not purely a case of aneurism, but of mortification also, similar to many which you have seen in the course of the season.

I shall therefore divide my observations into these heads: 1. The operation upon the artery: 2. The mortification: 3. The ulceration of the artery in the fore-arm: 4. The question of amputation.

1. On the operation I have to observe, that it is of consequence to make the wound as small as possible, consistently with the object to be attained; namely, the fair disclosure of the artery and the tying of it above and below the wound. The reason of this is, that if the wound be extensive, and the parts much injured, an inflammation will come on, which will interfere with the free

circulation in the collateral vessels ; which freedom of circulation in these smaller arteries is necessary to the supply of the lower part of the limb.

2. A superficial observer, whose knowledge was just sufficient to inform him that the circulation of a limb is necessary to its life, might conclude that the extensive mortification which took place here was a consequence of tying the artery. It had nothing to do with it. That yellow colour and œdematous swelling, followed by sloughing of the integuments, was a kind of erysipelas, of which you have seen several examples in cases of bruises and compound fractures during the present season ; and you must have observed here, that when the skin sloughed off, the flesh below suppurated, and threw up granulations.

3. Nor had the ulceration, which opened the artery in the fore-arm, any thing to do with the tying of the artery. It was a casualty to which a man of irregular drunken habits of life, and who had just recovered from the mortification of almost the whole integuments of the arm, was more peculiarly exposed. You will, however, have remarked the character of the hæmorrhage ; true, it was from the *trunk* of the artery ; but it came circuitously through the *branches*, and therefore it did not flow with the powerful arterial impulse, but gushed as from a vein. However, I have seen in more favourable circumstances the blood delivered by jets from the lower orifice of the artery.

4. In such a case of secondary hæmorrhage, (which, however, does not deserve the name, since it bore no relation to the operation on the artery;) amputation appeared to me the only resource, and was so considered by my colleagues. If the arm had been otherwise well, we should have preferred taking up the artery, but in the state in which it was, this was not to be recommended.

CASE, ILLUSTRATING THE STATE OF A LIMB, WHEN THE MAIN ARTERY IS TORN BY MUSKET OR GRAPE-SHOT.

On the *2d July*, 1815, when in the operation room of the hospital of the Gendarmerie, at Brussels, a man was brought in who had been wounded in the thigh. He was reported to be dying of hæmorrhage. There was a wound on the fore-part of the thigh, and a wound on the back of the thigh. I had no doubt from the appearance of these wounds, that a biscayen had traversed the thigh. There was no bleeding when he was brought to me, the bone was not fractured, the confusion of the time deprived me of all means of knowing whether or not there had been a jet of arterial blood. I put him therefore aside, until operations of more urgency were performed.—Late in the day we were informed that there was a grand hæmorrhage, and of the main artery. He was again brought down.

I passed my finger into the anterior wound; it went over the thigh-bone, and there I felt the passage open into a great cavity. From the place of this great cavity I was aware that it had been made by the bleeding of the femoral artery; and the injury committed on the soft parts, led me to conclude that amputation ought to be performed. But I did not amputate, but thought it safe in the meantime to tie the artery. Therefore, thrusting my finger into the wound, I directed it upwards, to the highest part of the cavity in the direction of the femoral artery. By this means I marked the place of the artery on which I should cut. The inguinal artery being compressed, I opened the sac by cutting on my finger as a directory, and washed out the coagula. I then dissected the femoral artery from its sheath and tied it, laid lint in the cavity of the wound, and lightly bandaged the limb.

I have no particular account of this patient, nor of many other interesting cases. That hospital was at this time in much agitation, fifty wounded being brought in that morning, and as many momentarily expected.

In the return, on the 26*th* of *July*, it is stated, "*mortification of limb followed the operation on the* 8th day;" and in another column, is the expression, "*sloughing and gangrene*," "*died* 12*th of July*."

Remarks on the preceding Case.

When a ball passes through the main artery of a

limb, and when in addition to that, there is a large cavity with the walls gorged with the driven blood, it is a case for amputation. You will not fail to distinguish the difference between such a case and the former, where the main artery was struck with a knife. It is this: when the main artery is tied, the circulation being carried on by the collateral vessels, and these collateral vessels and the whole diameter of the limb being injured and inflamed, as must be the case when a ball traverses the limb, these lesser vessels are suffocated in their action, and the lower part of the limb becomes benumbed and cold, and mortifies. I therefore considered what I did here as insuring temporary safety only. If I had seen the patient next day, and found the foot livid, I would have amputated the limb. Perhaps I should have done so at first; in which case the circumstances of the time must be my apology.

Of Bleeding, from returning Vessels.

I observed a very singular occurrence, on the same day with the preceding case. A Frenchman had his thigh-bone shattered with a grape-shot. It was necessary to amputate, were it only to give him a few hours rest from his suffering, and his entreaties were most moving.

The artery was compressed, by the thumb of an assistant, on the groin. I began the operation by cutting down upon the artery, and tying it. In these wounds it is not always possible to perform

the circular double incisions. It was necessary to make a flap of the integuments and muscles, on the inside of the thigh, which, when I had done, with one stroke of the knife, and cut across the femoral artery; we were surprised to see the jet of blood from the lower orifice, although the artery had been tied above, and not a drop flowed from the upper orifice; and we had time to observe the blood flow thus retrograde in so many distinct jets, or pulsations, that I was forced to make Mr. Shaw hold the lower artery with his finger and thumb, while I completed the amputation, by dividing the remaining part of the limb.

This appeared to me a remarkable and important circumstance; and it struck me so forcibly even at that time, that I called out to every one present to remark it, and to consider how decisive it was of the freedom of inosculations, and how directly the limb was supplied with blood on the tying of the arterial trunk.

The occasion of my emphatically dwelling on the necessity of a double ligature of the artery, that is to say, of tying it below the wound of the artery, as well as above it, was this:—during the riots which took place when Sheridan was Candidate for Westminster, a Savoyard was struck in the arm with a knife; it was dark, and the passengers heard the blood flow on the pavement as the splashing of water. He was attended by a gentleman, then one of my students,

who suffered himself to be over-ruled, and the bleeding artery was pulled out, and tied with a single ligature. This patient was carried to an hospital, and died of successive hæmorrhage from the blood returning by the inosculations, to the lower portion of the artery.

Before I present you with examples of successful operations by those who have preceded you here, I shall further illustrate the effect of returning blood in the wound of the inguinal artery, by an extract from the letter of a pupil.

WOUND OF THE INGUINAL ARTERY—THE EXTERNAL ILIAC ARTERY TIED—FATAL, FROM HÆMORRHAGE BY RETURNING BLOOD.

A man, of 25 years of age, received a wound in the groin by a sharp piece of iron, which was accidentally thrown. The inguinal artery was opened near the edge of Poupart's ligament. The man finding the blood spouting from him, had presence of mind to draw the integuments together, and hold them firmly with his finger and thumb. It was an hour before the surgeon arrived; and when the finger and thumb were removed, the blood spouted up, with a whizzing noise, to a considerable height. The wound was dilated, and an attempt made to secure the bleeding vessel, but they did not succeed. By thrusting the finger

into the wound, and compressing the artery, the hæmorrhage was arrested.

The patient having, by the attempt to catch the artery, lost much blood: it was found necessary to tie the external iliac artery. An incision was made, commencing a little above Poupart's ligament, and to the outside of the abdominal ring: the integuments were divided upwards, making an incision of three inches in length. The tendon of the external oblique was next divided, and the fibres of the lower muscles exposed; these were divided also, and the peritoneum laid bare. The fore-finger was then introduced to push up the peritoneum; two small, but firm, ligatures were put around the artery: one of them was tied. When the assistant's finger was withdrawn from the lower wound, a considerable flow of blood continued, although the pulsation of the artery, immediately below the ligature, was not to be felt. However, on the second ligature being firmly drawn, and tied below the first, the bleeding ceased in the lower wound. A third ligature was applied as high upon the artery as possible, and that first applied was cut out.

20*th*. viz. *second day*. Experiences uneasiness in the limb; and says, that it is colder than the other. P. 88.

21*st*, *hora* 8. *p. m.* He has become feverish; complains much of pain in the wound and abdomen. Sixteen ounces of blood have been taken from him. Skin, 154°.—P. 120. Strong and full. Resp. 28.

The journal is regularly transcribed in my papers, giving two reports each day, till the 10th day, from the operation; and, during this time, the symptoms were, on the whole, favourable. But, on the night of the 28th, the surgeons were alarmed by a sudden message, that the blood was flowing very fast from the wound. On their arrival the patient was speechless; the blood still flowing, and of a dark colour. They commanded the bleeding, by thrusting the finger into the wound; but the patient almost immediately expired.

On dissection, it was found, that the femoral artery was wounded just where the profunda is sent off;—about a third of the femoral vein was also divided. The ligatures were found correctly and securely tied; and, above the upper ligature, the artery was distended with a coagulum of two inches in length.

The preparation is in the museum; and there it may be observed, that there is no clot in the artery below the wound, as there is above the wound.

Remark.

The gentleman to whom I am much indebted for this case and preparation, and those who assisted, (among whom I am happy to reckon another friend and pupil,) believed, that the hæmorrhage came from the vein, and not from the artery. This is certainly possible; and they had

the best means of judging. Yet, on looking to the preparation, and considering the suddenness of the hæmorrhage which carried the patient off, I cannot help concluding, that the blood came from the lower part of the artery.

I have no hesitation in repeating here the advice I have urged, for these ten years past, in such cases. The bleeding vessel must be secured by a ligature above, and another below the bleeding orifice. And, in giving this advice, I have added another recommendation, which has been also strangely neglected, like some other tenets of our Windmill Street school. When an artery is wounded so high, that there are no means of restraining the blood, so that the artery may be neatly and securely tied, an incision to admit the finger to compress the artery nearer the trunk, will make the case simple, as thus :—

If a man be wounded in the axilla, and the sponge suppresses the bleeding, but leaves no room for the operation of tying the axillary artery; I have recommended, that a small incision be made above the clavicle, to let the finger down upon the first rib, where it will effectually compress the artery, and let the wound be cleared, and the bleeding vessel be securely tied.

If a man be wounded in the throat, or under the jaw, the bleeding may, by the same means, be stopped, the wound cleared of blood, and the vessels tied.

On the 1st of July, last year, in the Caserne,

St. Elisabeth, I saw a soldier, of the 44th, who had received a push of a sabre behind the angle of the jaw, and whose carotid artery had been tied. The point had entered the mouth, and cut the tongue obliquely, so that it hung out. There was much blood lost at the moment; and an alarming hæmorrhage occurred on the fifth day after. An attempt was made to stop the blood by the graduated compress; but as the surgeon was leaving the ward, the hæmorrhage burst out anew from the mouth.

An operation was, therefore, necessary; and the common carotid was tied. In similar circumstances the operation has been twice performed in this manner by our surgeons at home. I think a pupil of Windmill-street would have proceeded differently when he made the incision on the neck. He would have compressed the carotid betwixt his fore finger and thumb; and, using them as a tourniquet, he would thus have arrested the blood, and have had an opportunity of seeing the bleeding vessel; and he would have tied the external carotid, not the common carotid.

In the case which we are now considering, the wound of the inguinal artery; the operators ought to have made the incision through the skin of the belly, and through the tendon of the external oblique; and then pushing up the lower layers of muscles, they would have had it in their power to compress the artery effectually; which done, on sponging out the lower wound, they might

leisurely have tied the artery above and below the breach in its side. They would, also, have seen the vein open, and might have secured it.

This subject will be resumed in the examples of wounds of arteries of the second class.

REPORT,

OF CASES OF WOUNDS, OF COMPOUND FRACTURES, AND GUN-SHOT FRACTURES, IN WHICH THE QUESTION OF AMPUTATION IS BROUGHT FORWARD.

The wards containing, at present, cases which must have excited the sympathy of the pupils, and taught them to reflect, with great interest, upon the question of amputation, I think this the best time to review the subject, in reference to the practice of the whole season. The pupils have seen, with their eyes, those things, of which no words can convey a distinct impression, and which are, notwithstanding, necessary to the comprehension of this question, and to the formation of a right judgment.

This is a subject of great extent, and embraces a great variety of diseases; but I shall throw out of the discussion the cases of wounded arteries, white swellings, carious bones, tumours, &c. and confine myself to the questions of amputation, in the cases of wounds and fractures. Through the whole range of these cases, the influence of

the constitution, on the wound, is the circumstance the most to be attended to; for without reflecting on this—without determining how much of the character of a wound is a direct consequence of the injury, and how much is to be ascribed to the reflected influence of the constitution, a very difficult question is made still more obscure. I shall, therefore, present, in the first instance, examples of slighter injuries, aggravated by the vice of constitution, and giving rise to the question of amputation. The question will then be stated in reference to the violence sustained, as by machinery; then will follow the examples of compound fractures; and, lastly, a comparison will be instituted betwixt the compound fracture, and gun-shot fracture.

OF AMPUTATION, IN CASES OF SLIGHT INJURIES, FOLLOWED BY MORTIFICATION.

George Robertson, aged 23, admits that he has lived freely; he has been a wine drinker, for he is a wine-cooper. In carrying a basket of wine he fell, and a portion of glass cut him in the ball of the thumb and a good deal of blood flowed; and as this happened in Newman Street, he came immediately to the hospital. A piece of glass was taken from the wound. Three days after, when he returned, the hand had become considerably swelled,

and he suffered great pain. He was ordered a cold lotion for the hand, and a dose of *Pulv. Ipecac. Comp.*

On *Friday*, the arm was much swollen, and very painful; and vesications were formed on the back of the hand. In the evening he returned so much worse, that he was taken into the house. The arm is inflamed and swollen, and vesications are appearing. A poultice is applied to the wound, and a cold wash to the arm:—*Capiat Misturam Salinam, cum P. Ipecac. C. horâ somni.*

Sunday. The arm appears rather better; but the man is very ill. He has not slept; the pulse is quick, the skin hot, and the tongue dry. Leeches have been applied to the arm.

Monday. This man is not so feverish; the thick cuticle has been cut away from the thumb, and exit given to the matter. He continues to take the saline mixture, with ipecacuanha, at night, with bark decoction and wine during the day. The whole arm is laid in a poultice.

Wednesday. The arm is very tense, with many black spots; the discharge from the hand is good. P. 116.

Thursday. During the night, an abscess burst on the inside of the arm. He has complained of pain in his right side, and has a cough. A blister is to be applied to his side; and, instead of the bark, the following:

℞ Misturæ Camphoratæ ℥ii.; Liq. Ammoniæ Acetatis ʒii; Confect. Cardiacæ ʒss. ft. haustus.

Friday. He is so much relieved in his breathing, that he is to return to his bark. The abscesses on the fore arm and elbow joint have been opened. His skin is moist; his pulse is 120.

Saturday. His arm is much worse; the discharge is in great quantity, and not good; the skin is undermined, and there are sphacelated patches, while the general colour is of an unnatural redness: the inflammation extends towards the shoulder. With this, he has still pain when he coughs; and there is a blush on his cheeks. His skin is dry, and the tongue browner; pulse 106.

It was at this stage that I was called to him on account of bleeding from the back of the hand. He had been permitted to bleed a great deal; for I found that the blood had soaked through the bed to the floor. It was stopped before I arrived.

On *Friday night*, notwithstanding the precautions taken, the nurse, who was to watch him, falling asleep, he lost two pints of blood from the ulceration of the ulnar artery. Mr. Joberns was called, and he performed amputation.—*Tuesday, Feb.* 11.

In consultation, the necessity of the operation had been foreseen and declared. In such an arm, the integuments having sloughed, and the part remaining separated from the muscles, ulceration is particularly apt to open some considerable artery, in which peculiar circumstances of the limb amputation is advisable; for both the state of the constitutional powers, and of the limb itself, forbids dissection to be made for arteries; and if

readily found and tied, they would be apt to break out again, such is the tendency to ulcerations.*

Let my reader compare this case with that in the foregoing Report, on the ligature of arteries, in which the humeral artery was tied.

BIRD'S WARD.

Here is a woman about 30 years of age, with a wild gipsey face; she says, she travels the country, and I suppose, sleeps under the hedges. Some charitable persons in the country have sent her up to have her leg amputated.

The integuments from the middle of the leg to the root of the toe have mortified; the bone, muscles, and tendons are exposed and ragged, and the ankle-joint opened; the parts are lying loose.—She is in great pain and distress of mind, calling loudly to have her leg removed.

Consultation.—It appears from her account that this extensive mischief arose suddenly from a small sore which she has had on her ankle for some years. 1. It is inquired whether the joint be exposed, as in that case it will be impossible to save the leg? The joint is exposed and the necessity of amputation is obvious. 2. This decision is confirmed by the extensive destruction of soft parts, which, even in the event of recovery, would make the limb useless. 3. The question as to time remains; it appears that the line of separation

* I find that Mr. Parsons, the house surgeon, did include the artery in a ligature, and that it gave way.

is not well established. Let her be put to bed and take some warm wine with an aromatic, and apply the sour poultice with charcoal to the whole limb, and let her have what nourishing food she can take.

2d Day. The countenance is better.—Lint dipped in camphorated oil is put betwixt the deep sloughs and the poultice applied over them. The wine to be increased.

℞. Cinchon. pulv. ℥i. Rad. Serpent. Virg. ʒvi. Coque in Aq. ℔i. ad ℥xii. Liquoris Collatæ ʒx. Tinct. Cinchonæ Comp. ʒii. Acid. Muriat. dil. gtt. vi. ft. Haustŭm ter quotidie sumendum Haust. Anodynus h. s. sumendus.

3d Day. Since her admission the countenance and pulse are much improved, there is less thrill in the artery; a line of separation by ulceration is distinctly marked, and granulations are distinguishable in the midst of the sloughs.

4th Day. She does not improve, and as further amendment is not to be expected, I shall amputate.

She recovered very soon, and went out of the hospital with a fresh and clear complexion.

QUESTION OF AMPUTATION.—MORTIFICATION FROM IMPROPER BANDAGING IN FRACTURE.

An elderly man, a lean artificer, fell from a height and broke both the bones of the fore-arm, the surgeon had put on splints and a bandage

without due attention to the inevitable degree of swelling, which must accompany so great an injury. In the morning, when brought to the hospital and examined, the hand was swollen, dark, and cold: and although the bandage was immediately undone, the impression was made, and vesications appeared upon the surface. In a few days the whole fore-arm and hand mortified.

Consultation.—The arm is acknowledged to be irrecoverably gone, a line of separation is commenced in the blush on the skin, which goes round the elbow, but the age and circumstance of the patient forbid the hope of the fore-arm being cast off [as in the succeeding case] at the elbow-joint. The mass of mortification is at this moment weighing upon the constitution. The consultants agreed that it could not be expected that the mortified arm should slough off, and that an operation afforded the only hope.

Then the question arose, was this the proper time to amputate? It was observed on the one hand, that the operation should not be deferred; 1. Because the line of separation was commenced, shewing the system capable of an effort. 2. Because the man's pulse was better through the influence of wine, bark, opium, and ammonia; an effect which could not be relied on for any considerable time. 3. The skin was free above the line of mortification and inflammation, which might not be the case to-morrow. Against this it was suggested that the man was better to-day than he was

yesterday, and so might be in a situation better able to undergo the operation to-morrow.

14*th*. This man's tongue is cleaner, his pulse is firmer, his senses are improved, he has had less delirium; he is more alive to what is going on around him But a hardness of the skin, with inflammation, is spreading up the arm on the inside; advice was again asked, and amputation performed.

One o'clock. The patient bore the operation well; indeed, it was quickly done, so that I hoped there was not much shock to the constitution. He lost no arterial blood. It was observed, that the smaller vessels were more active than the trunk. When they were tied, the profunda humeri was seen to pulsate; but the humeral artery, though tied, distinct and separate from the surrounding substance, did not pulsate. This was a singular circumstance, and is to be explained by the consideration that the main artery belonged to the fore-arm which was dead, and the branches to the arm where there was still circulation.

Five o'clock. He has taken some generous soup, and a little pudding; every four hours he is ordered four spoonfuls of port wine, in which the extract of bark has been infused, and he is to have an opiate in the evening.

Evening. His pulse rose from the operation, and remains fuller than in the morning, he is quite sensible, and vain of his nonchalance.—*2d Day.* He slept six hours last night. Countenance bet-

ter; tongue cleaner; pulse much fallen and quicker. —*3d Day.* Pulse 92 and stronger, the dressings have been partially removed from the shoulder; the integuments are not so full as I could wish. The wine is taken from him, he is indulged in ale, and it agrees with him.—*5th Day.* He was dressed to-day, the stump discharges a considerable quantity of thin pus; pulse 96, and tolerably steady.—*6th.* A hardness of the integuments has taken place, yet the pus is not bad. The pulse numbers as yesterday; but there is more thrill in it, and the tongue is brown. He is, if possible, to take more nourishment, and his wine is to be resumed.

This man continued to sink, rallied again, under the most diligent attentions of the apothecary and house surgeon; who rose, during the night, to feed him, and give him his brandy in his gruel; but the stump dried up and he died.

A similar Case.

I perfectly recollect the first case of this kind I ever saw. I mean mortification of the fore-arm, from tight bandaging. I was walking in the New Town of Edinburgh, when a lad fell from a great height on the pavement before me. He was a glazier's lad, about fourteen years of age. I put him into a hackney-coach, and carried him to the hospital, for he was insensible from an injury of his head, and the bones of the fore-arm were shattered. When I saw him next day his hand was swollen, black, and cold. The house-surgeon had put splints upon the fore-arm, and rolled it, without calculat-

ing on the necessary tumefaction; the hand was strangulated, and had swelled like a boxing glove; and when the bandage was cut off, which was no easy matter, from the swelling overhanging the edge of the roller, vesications were already formed, and after this the whole fore-arm ran rapidly into mortification. But the lad had youth and health; a line of separation was very soon visible around the elbow-joint, and the fore-arm sloughed off at the joint. The stump left, consisted of loose granulations, which were brought over the end of the humerus. The cartilages of the joint exfoliated, after which the integuments fell together and closed.

*Nov.** The two instances which are now to be seen in *Percy's Ward*, of wounds of the arm, are very good examples to you of the great distinction to be observed in the constitution.

On the one side you have *William Boon*, whose arm was half cut through with the teeth of a great wheel: here you see the phlegmon subdued, and the man doing well; and on the other side you have *Stephen Jennings*, whose arm is as black as my hat, and whose knuckle only was scratched with a piece of glass, who is certainly in danger of his life. Boon was turning the wheel, used in a spermaceti manufactory, and slipt and fell forward, so that his arm was caught in the cogs of the wheel. The sharp angle struck deep into the fore-part of

* From Clinical Lecture.

the arm, and has completely divided the biceps, and passed through the brachialis internus muscle, and the bareness and roughness of the bone shews the force of the blow. The artery escaped, but it can be seen and felt beating in the bottom of the wound. This man is young and in health, the treatment has been simple: 1. to keep down the inflammatory action: 2. to attend to the anatomy and keep the divided muscles together by a due degree of relaxation of the arm.*

Here you see the countenance flushed, the tongue white and furred, the pulse 110, full and strong, and much thirst. I hope you have also seen that the application of spirits from the shoulder to the finger ends, sunk the pulse, diminished the flushing and disposed him to sleep; and if this had not been done, extensive suppurations would have formed in the substance of the limb, and the nature of the inflammatory action would have changed.

The case of *Jennings* is more to our present purpose, and deserves a detail, not by any means, on account of its singularity, but because it describes a very frequent occurrence in hospital practice.

Stephen Jennings, aged 38, admitted Nov. 8. About a week ago, in drawing a cork, the bottle burst, and he cut the knuckle of the middle fin-

* In such a case, if the arm be too much bent, the muscles project from the wound of the integuments. If too much extended, there is a space betwixt them.

ger. He applied Friar's Balsam, and bound it up. It swelled; and he passed the succeeding night in great pain. When he applied as an out-patient to the hospital, his hand and arm were very much swollen; and the wound was dry and irritable. He was ordered a dose of calomel and a purge, and an anodyne fomentation to his arm and hand. Five days after this, he returned petitioning to be admitted. The arm was now swollen to twice its natural size, from the fingers to the shoulder. Its colour was a bright lake, which disappeared on pressure with the finger. The cuticle was not simply raised in vesicles, from which the fluid might flow readily; it formed a more spongy elevation, producing the peculiar larded appearance on the surface. The tepid sour lotion was applied to the arm; his bowels were again moved, and he took a mixture of bark, with a diaphoretic draught, at night.

Nov. 9. He has passed a better night than hitherto; but the arm is very much swollen, and two discoloured spots are seen on the middle of the fore-arm. The succeeding nights he passed indifferently; he complained of a tingling pain in the arm. The cuticle has come off in many places, and the skin is red below. The black spots are disappearing; the general swelling has diminished; the appetite is tolerably good; the pulse 88. The purgatives to be repeated, and the cordial mixture to be continued.

After a second interval, the report proceeds.—

This arm has followed the usual course; the general tumefaction of the arm subsided; portions of the true skin sloughed off; a flaccidity succeeded; and warm and stimulating fomentations were ordered. Then suppurations took place very generally under the skin, which were relieved by free incisions; but, notwithstanding that the cellular membrane sloughed very extensively, by opening the bowels freely, and by managing his support so as to increase it with the necessity of his situation, he is now out of danger. This man has recovered; but his arm is like a piece of stick, immoveable in consequence of the tendons becoming soldered to their sheaths, and the intertexture of cellular membrane having been lost by the sloughing and suppurations.

The following case will more distinctly shew the *remoteness* of the connexion betwixt the injury and the mortification.

William Welsh, aged 26. A month ago this young man was brought into the hospital with a fractured thigh-bone, and till this day, the 20th of September, he has gone on uniformly well. On complaining of pain in his left arm, I examined it, and find it much discoloured, of a mulberry colour, and somewhat tense and swollen; it is hot, and vesicles have formed upon it. He says he feels as if the arm was screwed betwixt two boards. Restlessness and sickness preceded this appearance. The countenance is dejected; the

pulse is full and slow, and the tongue brown. On the sound foot there is something of the same appearance. The parts affected to be fomented; he is to have a purge, and afterwards wine and bark.

Sept. 22d. The right arm has assumed the same appearance with the left, beginning in the same manner. Camphorated spirit of wine has been applied to the discoloured parts.

23d. The left arm is improving; for, although the blackness extends to the breadth of the hand, there is a redness around the blackness, as if the disposition to spread had stopped. The tumefaction of the arm is considerable; the pulse is regular, and the tongue cleaner. He is ordered a bolus of camphor and volatile alkali, every fourth hour.

25th. By the omission of the camphorated spirit, the mortification has rapidly increased; but has been again arrested by the application of the spirit. There is a bloody sanious discharge from the margin of the blackened surface; but the red line around these edges has no freshness of colour, and proceeds from veins turgid with ill oxygenated blood.

26th. To-day lividity of the right shoulder has taken place. During all this time the broken limb is free from discoloration. There is now a swelling of the temples; it extends over the face, and closes up the eyes. He has become lethargic, and his breathing loud; but he is capable of being roused. He is taking the citric acid and Ma-

deira, and has a stimulating embrocation applied to his stomach.

28*th*. Although in this state of debility, purges were again given to him, and repeated, and much hardened fæces were discharged with evident relief.

29*th*. The swelling diminished; he is delirious; he asks leave to go home, and uses argument to aid his entreaties. He has a hacking, teazing cough, and now it is attended with bloody expectorations. The swelled parts have much subsided, and are yellow. Died in the evening.

Remarks.

These five cases present examples of mortification from slight injuries; and which, in happier circumstances, and in better constitutions, would have done well with common attention. When mortification occurs from a wound, and the question of amputation is to be discussed, the determination will depend on a satisfactory answer to the following questions:

1. Does the mortification proceed from the violence done to the part, or does it come of the constitution?

2. Has the mortification extended so widely, and destroyed so much of the substance, that, in the event of recovery, the limb will be useless?

3. Has a large joint been opened?

4. Has the mortification gone so far, that, even in the event of its stopping, the suppurating surface

will be too extensive for the powers of the constitution?

5. Are the great vessels undermined, and is there danger of fatal hæmorrhage?

With regard to the operation of removal, in cases of mortification, it was formerly the practice to take off the limb by cutting betwixt the living and the dead parts. Was this attended with any other advantage than avoiding the hæmorrhage? if not, we are right in performing the operation as we do now. Dr. Kirkland has suggested the propriety of separating the limb at the line which distinguishes the living from the dead parts. But, in these cases, this would have been impracticable; for the deep parts of the limb are alive, when the surrounding integument, and cellular membrane, and fascia are dead, to some extent higher up.

QUESTION OF AMPUTATION, ARISING OUT OF THE SEVERITY OF THE ACCIDENT.

William Currell, 50 years of age, robust, and of regular habits. The fly-wheel of a steam-engine catching his apron, drew him in, by which he has been dreadfully bruised and lacerated. His left tibia is fractured, near the knee, and the joint injured. The bones of the left fore-arm are shattered, and the integuments and muscles bruised irrecoverably. The right arm is lacerated;

the wound extends from the outer condyle to the arm-pit. The humerus is bare, and a ragged point sticks up.

Consultation.—Here is a question of great interest. The left arm must be taken off; the bones being shattered, and the integuments and muscles being mashed and torn, and the fingers already lifeless. But is this enough? can the right arm be saved? the flesh is torn from the elbow to the shoulder, and the bone fractured. Here, upon a further examination of the bone, it was found that an iron tooth, or angle of the wheel, had entered deep, and made a notch in the bone, without altogether dividing it.

It was, therefore, determined, that, he should lose the left arm, by amputation, above the elbow; that an attempt should be made to save the right arm. Accordingly the left arm was amputated by Mr. Cartwright; the right arm was dressed: and the leg even set. Our apprehensions were for the man's strength failing, when the profuse suppuration should be established.

For three day's after the operation he promised well; but from this time, there being an extensive suppuration of the arm, debility of constitution was established; and, without any particular sign, he continued to sink, and died after slight convulsions.

A boy of ten years old: the third day of

his being taken in employment in a manufactory where a steam-engine was in use, had his fingers drawn into the machine, and the hand mangled. The fingers are torn off, and only part of the metacarpal bones left. The thumb is dislocated, and the tendons laid bare. The tendons of the fingers hang by the remaining part of the palm; and the integuments of the back of the hand are loose, and have been bruised. There is no bleeding, nor has there been any from the first.

At a *consultation*, amputation was determined on.

1. There is no probability of saving the thumb, and the fingers are wholly gone.

2. It is a bruised wound; the bones are broken; the tendons and ligaments are exposed. We must expect great irritation to come on. We, therefore, cut off a part, which is useless, to ensure the boy's safety.

The amputation was immediately performed, and the boy did well. The ligatures were taken away on the 9th day, and the integuments were adhering.

When a limb is crushed by machinery, the bones broken, but the integuments not cut open, the extent of the injury is concealed; and, in the attempt to save the limb, we find it shortly become a bag of matter.

A case occurred, of which I find only the fol-

lowing note for clinical lecture:—"You have seen the examination, and heard the consultation. My attention was not called to this boy early enough to enable me to give you the details of the case. The boy's arm was drawn into machinery, and the bones of the fore-arm, and the humerus broken, accompanied with a small wound of the integuments. A consultation was called; and we found a bag of bad suppuration; the broken bones felt loose in the bag of matter; and the impression of death was on the child's face. He died fourteen days after the accident; and the manner of his death forms an important feature in this question of amputation."

A boy, nine years of age, was received into the hospital about eight days ago. He had fallen into the entanglement of a carding machine, driven by steam, by which the tendons of the leg, on the fore part of the ankle, were laid bare, and the ankle-joint opened on the outside; the integuments of the thigh were also lacerated.

My opinion being now requested on the propriety of amputation; I find the boy pale and exhausted, and nervous through extreme weakness. There is a shaking which amounts to subsultus; the pulse is weak and tremulous; the tongue brown and dry; he is collected only when roused; his look is startled and anxious, accompanied with a convulsive trembling of the cheeks

and nostril. The laceration of the thigh is not deep; it is moistened with purulent discharge. The ankle joint is laid open; the joint betwixt the os calcis and the cuboides is also open; the soft parts are in a sloughy state; they are now moistened with purulent discharge. It is only this moment that the lad's mother would consent to amputation, and now it is too late. These questions are discussed: Is he better to-day than he was yesterday? No; rather worse. Is there any expectation of his being in a more favourable state to-morrow? No. Can he ultimately sustain this wound? No. And in these circumstances the only hope is in amputation of the foot; but yet we fear the delay will prove fatal to him.

The operation was performed; and it was an unfavourable symptom, that on the arteries being tied, there was no pulsation against the ligatures, and no loss of blood from the smaller branches.

2d day. He is worse; less collected, skin more moist, tongue dry, has subsultus.

3d. Pulse 120; the wound on the thigh dry; altogether much worse. Died the morning of the 4th day.

16th Aug. Sarah Arnold, aged 35, five months gone with child, was last night brought into the hospital. Her hand had been drawn into a carding machine, which was moved by a steam engine. The hand was crushed, and amputation was immediately performed by Mr. Cartwright. Not-

withstanding her pregnancy, she has not experienced a bad symptom, and this day she is dismissed. 10*th Nov.*

*** On this short note, it would be natural to make some remarks, did not the question of amputation during pregnancy form the subject of a consultation in a future Report.

William Crump having examined the loading of a gun, was returning the ramrod, in doing which the palm of the hand came smartly on the muzzle of the piece, and it went off. The gun was loaded with slugs, and the whole contents went through his hand. The nearer ends of the metacarpal bones and the carpal bones were destroyed, and the whole charge has been driven through the back of the hand, leaving a hole which admits the ends of four fingers. The first bone of the thumb and the metacarpal bone of the little finger are all that remain entire. The tendons of the back of the hand lie exposed, torn across, and curled up; the powder is driven into the integuments. Until this man came into the hospital, there was no bleeding from the wound; but when he was put into bed, an hæmorrhage took place to a very considerable extent, before the tourniquet was applied. An amputation was performed in the fore-arm three hours after the accident. A discolouration had by this time, extended up some part of the fore-arm.

Remark,—You will distinguish this sort of case from a gun-shot wound of the hand or wrist.

Thirteen days after the battle of ———, I saw a man brought into the hospital who had received a wound by a musket-ball, which had passed through the palm of the hand, near the wrist. The hand was amputated.

This was, in my opinion, an improper decision, for although the hand be in such a case greatly swollen, and the luxuriant excrescence from the wound gives an appearance of malignity; yet, as there were no symptoms indicative of danger, I thought the hand might have been saved.

REMARKS ON THESE EXAMPLES OF WOUNDS BY MACHINERY.

The velocity and weight of the levers and wheels of machinery moved by steam, make wounds intermediate, as to their effects, betwixt the common accidents of life and those from gun-shot. When the body or higher parts of the limbs are struck by machinery, we witness a degree of commotion, and consequent debility, while in the wound itself we see that the lips are bruised, and must slough before they granulate and heal; so that these effects together, make a wound closely resembling that from gun-shot. They have sometimes another point of resemblance to the contusion from spent cannon-shot, viz. that the bones are broken, and the internal soft parts irrecoverably bruised, without an external wound: that they do not bleed, although considerable arteries are open-

ed, is only another proof of the contusion, which belongs in a still greater degree to gun-shot.

Compound Fracture, with wounded Artery.

——— ———, aged 49, being quite sober, in crossing one of the streets leading to the New Road, was knocked down by a carriage; he was stunned, and on recovery found people around him, who told him he had been run down. Both legs were fractured; the wheels must have gone over them.

The tibia of the right leg was broken. On the fore part of the leg the integuments were as if cut by a knife; a triangular portion of the bone was loose, and lying opposite to the wound; it was extracted. The finger being introduced, many broken pieces, small as sand, were felt; some of them have been picked away. This limb has been put in junks, and the wound brought together. There is also a compound fracture of the left leg, and from a small wound on the fore part of the leg, there is a considerable hæmorrhage of arterial blood. This wound was enlarged; the blood came from betwixt the portions of the bone. It may be from the nutritious artery of the tibia; but the quantity leads us to fear that one of the tibial arteries is wounded; both bones are broken. Cold cloths were put upon the limb, from the toe to the groin, with the intention of stopping the hæmorrhage; for in these circumstances, to attempt to stop a bleeding artery with a compress, is to drive the blood into the loose parts, and among the torn cel-

lular substance. It was permitted to ooze to the extent of eight ounces, and then the blood coagulated.

30*th*. He passed a sleepless night, troubled with spasms in his left leg ; the left leg is also in junks, and is kept moist with spirts and water. There is a calm at present, but the suppuration must be extensive. The left leg, from the degree of extravasation of blood that must have taken place, I consider the worst.

31*st*. Mortification of skin appears on the left ankle ; this is from injury and œchymosis, not mortification resulting from the general state of the limb ; but it may spread, and reach the mass of extravasated blood. It must at all events increase the extent of suppuration. There is a little oozing of blood from the wound, and as the limb is swollen, and the foot hot, the cold spirituous application is continued.

What I like least is the state of his pulse, 120, and of a bad action ; there is a run of perhaps ten beats ; then it stops, or goes on at a slower rate ; it conveys a sensation to the finger like the vibration of a wire. He is not so collected in his mind.

2*d April*. The pulse is very feeble, irregular, and intermitting. The character of his mind is still a gentleness, giving ready assent to what is proposed for him, but he has at times a mild delirium. The right leg is rather deficient in action ; the lips of the wound are dry ; there are vesicles around the back part of the leg, and the colours are black, blue, and red, and moistened by an

oozing of discoloured blood. But what is worst of all, is a dark and tawny red, which extends from the wound. It forms a streak of an inch in breadth, extending upwards, on the inside of the knee and thigh. Fomentations to be applied to the limbs. His wine to be augmented.

Evening.—He refuses his wine and brandy; talks incessantly; the pulse is fluttering; the tongue is black.—*3d April.* The right leg dry, and without action; the dark inflammation extends to the groin, and covers the back part and inside of the thigh. The pulse rapid, the breathing hurried, his cheek is hollow, and bedewed; there is an expression of terror on his countenance, but he is not sensible of his situation. Died at two o'clock.

Compound Fracture.

William Carter, a hackney-coachman, 34 years of age.—On the evening of *Nov.* 17, he had, as he said, taken a glass of gin, and on getting up on his box his foot slipped off the wheel-iron, and was caught between the spokes of the wheel; the horses moved on; he fell on his side, and in his fall extricated the leg. This happened at Hampstead, and he was brought into the hospital the same evening at 12. Both bones of the leg were fractured; there was a considerable laceration of the integuments on the inside of the tibia, but they were not at all bruised; there was very little bleeding, the leg was distorted, and on putting the finger into the wound, a large portion of the bone was

found detached from the two broken extremities, the limb was extended, and the middle portion replaced; there was considerable difficulty in this operation, the eighteen tailed bandage was put on, and the leg placed in junks with a cold wash over the dressing; the bowels were opened, and the pulse continuing strong, the house-surgeon gave him a saline mixture with digitalis.

This man went on very well until the seventh day after the accident. On this day, the matter not looking well, and having the appearance of the grounds of wine, a fermenting poultice was applied.

Thursday, 28*th*.—The discharge is very much increased; he is ordered to take a pill of opium, calomel, and antimony at night, with saline medicines and bark through the day; he is also ordered four ounces of wine.

Friday, 29*th*.—On lifting the limb to change the bandage, a little blood oozed out of the abscess; this ceased on the limb being laid down in its place; the discharge still continues very great; his situation indicates the propriety of giving him every means of support.

Sunday, *Dec.* 1.—The wound is dressed daily, and the matter gently pressed out; but this being the day on which the limb is raised, to shift the bandage, the bleeding recurred, it ceased upon the limb being laid down; the discharge is copious, but rather better in appearance; the quantity of his wine is increased. He has perspirations at

night, yet neither the tongue nor countenance indicate much constitutional derangement.

Tuesday, 3d.—The junks being again raised, the bleeding returned rather more seriously; but it ceased on the limb being laid down quietly. Two ounces of wine to be added to his usual quantity.

Saturday, 7th.—To-day, when the junks were lifted, the bleeding returned with great violence; the artery was compressed at the groin, and again on laying the limb quiet, the bleeding ceased. A consultation was now called to decide on the propriety of amputation; the limb was raised, but it did not bleed; an incision was made into a bag of matter, on the outside of the tibia, and some matter escaped. It did not appear to the surgeon that the bleeding was of a nature to authorise amputation.

11 *p. m.* On raising the poultice to-night, some suspicious spots of inflammation were seen.

Sunday, Dec. 8th.—There has been no bleeding; through the night the man slept well; but the whole leg looks ill. It is more generally swollen, and is becoming yellow in some points. The whole leg and foot is swollen and œdematous, with spots of a yellow colour, and very much resembles a severe gun-shot fracture about the tenth day. The thigh becoming œdematous, and the man's strength drooping, he has become more anxious for amputation.

On applying splints to support the broken bones, during the operation, the bleeding again took

place. It was stopped by the application of the tourniquet.

The man appeared, during the operation, to be too little sensible to pain; no blood was lost during the operation, but the pulse became alarmingly low; on raising him into bed his extremities were cold, and his pulse very small, and some fears were entertained, that he would have sunk. He took a little camphorated mixture with æther, as a cordial; in the course of two hours his pulse rose, but he had a wild expression, as of a person waking from delirium.

Monday morning.—He has slept a good deal, and is still very drowsy, and apparently a little indistinct. The tongue is dry; the skin moist; the pulse full. He has been ordered a pill of v. gr. of the extract of colocynth, and one grain of calomel to be followed by the oleum ricini, if necessary.

Tuesday.—He has still a wild expression in his eye; pulse fuller and quick, 120; the bowels are open, the tongue dry and brown, and he appears dejected, but has nothing to complain of. Repeat the anodyne, viz. the spiritus ætheris compositus, with a diminished dose of laudanum.

Wednesday.—He is better than yesterday; the outer dressings have been removed, and the stump looks well, with rather a deficiency of matter. Anodyne omitted to-night. A very little wine may be permitted.

Thursday morning.—He says he slept well, but on wakening, found himself shivering and cold.—

10 *o'clock.* He is now in the commencement of a hot fit; tongue dry; pulse 120. On examining the stump, some matter escaped from under the straps; a considerable portion has united. Ordered,

Decoct. Cinchon. ʒi.
Liq. Am. Acet. ʒss.
Tinct. Cinchon. ʒi.—4tis horis Sum.

and his wine to be increased to six ounces.

Thursday evening.—His bowels have not been open to-day. P. Rhei gr. xv. calomel gr. ii.; if not relieved in the morning, to have some house medicine. He has got a short cough, with pain in his breast.

6th January.—I think this man will be lost. The stump is full and fleshy, but the bone is seen black, and must exfoliate. There is something odd, as they say, about him. To-day he is sitting up, but he is not half the man he was in size, and the face is very yellow.

He is falling consumptive, if he survive the present stage. The accident and the operation have influenced the lungs and have produced this pulmonary affection; to which there has been formerly some tendency.

27th January.—He has been removed from the hospital some time, and is dying, being hectic, and having a purulent expectoration, with blood.

Remarks on these Cases of Compound Fracture, contrasting them with Gun-shot Fracture.

The transition from these compound fractures by machinery is direct to the matter of gun-shot fracture, and the cases illustrate each other. In

the instance of fracture of the bone, with an exposure of the broken ends, we are to bring the integuments together, and, by their union, to convert the compound into a simple fracture. But, when the case is the same in name, but very different in reality, that is, when there are loose pieces of bone and bruised soft parts, to endeavour to procure union of the integuments, is the very worst practice; for then there is formed a great bag of suppuration around the loose pieces and fractured extremities of the bones; and the portions which would in other circumstances unite and granulate, are thrown off, and being dead and loose, become a source of unusual irritation.

Gun-shot fractures are of this latter class; for there are often many pieces of bone loose, and the soft parts are bruised. But the circumstances are in this essential particular different from the case of compound fracture and bruised soft parts, inasmuch as the ball has entered by a small hole, which hole becomes still more contracted by the process of inflammation. The consequence of this is, that the limb becomes a bag of matter and shattered loose bones, without a possibility of free discharge. The reason of the discharge being confined is the swelling of the skin, and the plugging of the shot-hole with slough. That I am stating this from very accurate recollections I know, for my notes are to this purpose: "To-day I have examined one division of the hospital. These cases are very peculiar, and there is a sameness in their

character in which I cannot be mistaken. You see a small hole, such as might admit a bougie, the thigh or leg enormously swollen, and from the position you see that the bone is broken. I push my finger slowly into this hole; it enters by a sort of stricture, but all within is a vast cavity, and the jagged bones meet the finger. As the finger is withdrawn, there gushes out a stream of thin bloody matter. Such is the state of the gun-shot fracture fourteen days after the infliction of the wound, when nothing has been done to afford relief. I have, on other occasions, in different words, given the same description. "You see here the great swelling and inflammation of the limbs,—you wonder to see the wound so small; but there is something which you cannot see: the range which the finger has when introduced into the wound of the thigh, the putrid matter, with resolved blood, which spouts out, and the bones, sharp as pins, which are discovered within."

I have now, at different times, seen examples of the arm quite carried off by round shot; and in several of these the stump was left without even the loose pieces of bone being picked off the face of the wound. Three of these I took drawings of, at Brussels, to illustrate this very thing, viz. the manner in which the small pieces of bone continue to stick to the granulations and live. Apparently, there is not the smallest portion into which the bone has been shattered but remains alive, and adhering to the face of the stump. How does this come about?

and is it not in remarkable contrast with the example of wounds by musket-shot, where the pieces are loose in the bag of matter? Does not this countenance the belief, that the more open the wound the more likely are the pieces of bone to live and retain their attachments? There are, in my opinion, two reasons for opening the wound very freely in cases of gun-shot fracture. First, the opportunity it gives of picking out the insulated pieces. Secondly, the giving free discharge, which tends to preserve the remaining bones alive, and to prevent the matter from lodging in their cavities. This latter occurrence gives rise to necrosis.

At the time I had the best opportunities of confirming these remarks, there was too much to be done to allow time for taking individual cases; but among the very few persons I visited out of the hospitals there was one whose situation resembled those I have described. A musket-ball had struck directly on the fore-part of the thigh, crushed and pierced the femur. The ball was cut upon, and extracted from behind. The thigh was in a very bad state; with difficulty I turned the patient to one side, and introduced my finger into the counter opening. I found pieces of bone lying directly in the mouth of the wound. I opened the wound freely; and, with my fingers, extracted the loose bones, and gave vent to the matter, which, partly by the position of the limb, and partly owing to

the smallness of the counter opening, had been prevented from making its way out.

If this gentleman's thigh has not been attended to with the utmost care, and if the wound has not been kept perfectly free, his thigh-bone must be, at this time, necrosed; but I know not whether he survives.

In regard to amputation of gun-shot fractures, at the later periods, I have seen good reason to revert to the consideration of the subject of necrosis*. It is not necessary, on all occasions, to have recourse to amputation; and when it is, necrosis does not make a case for amputation at the socket. When the meditulium of the bone is destroyed by the progress of inflammation and suppuration, in consequence of gun-shot fractures, necrosis takes place; and the patient may be worn out with long suffering, if not relieved by amputation. *But the extremities of the bone are not subject to necrosis*; and, therefore, it can never be necessary, on this account, to dissect the head of the humerus, or femur, from their articulations. Further, were amputation to be performed for a carious thigh-bone, and were it discovered to be a case of necrosis, the dead sequestra might be brought away from the shell of new bone, and with it the whole occasion of protracted irritation will be removed.

* See a *Dissertation* on *Gun-shot Wounds.*

OF AMPUTATION IN CASES OF GUN-SHOT WOUNDS AFTER SUPPURATION IS ESTABLISHED; WITH SOME ACCOUNT OF THE OBSERVATIONS MADE IN THE HOSPITAL OF THE GENDARMERIE AT BRUSSELS.

On the breaking out of the war, I intended to follow the army for a short part of the campaign. My purpose was to perfect my knowledge of gun-shot wounds; to observe the difficulties in the arrangement of the wounded on a great scale; to learn the sentiments of the army surgeons actually engaged, in regard to some questions, purely practical; to enrich my collection, not only of cases, but of pathology, of preparations, and thus to fit myself the better to deliver my lectures on these subjects.

Before I arrived in Brussels, the battle of Waterloo had been fought; and, in one day, the campaign was concluded. Here witnessing the zeal of the army surgeons, and seeing them harassed by days and nights of uninterrupted professional duties, my first impulse was to express my sense of their unexampled exertions, where I thought my testimony might be of weight from its disinterestedness.

I had been for some days engaged in making my notes and sketches in the public hospitals, when report led me to a large empty barrack, afterwards called the *Hopital de la Gendarmerie*. Here the

very worst aspect of war presented itself; our soldiers were bringing in the French wounded. The wounded continued to be brought in for several successive days; and I saw the British soldiers who, in the morning, were moved by the piteous cries of those they carried, in the evening hardened by the repetition of the scene, and by fatigue, and indifferent to the suffering they occasioned.

It was now the thirteenth day after the battle. It is impossible for the imagination to conceive the sufferings of men, rudely carried at such a period of their wounds. When I first entered this hospital, these Frenchman had been roused and excited in an extraordinary degree; and, in the glance of their eyes, there was a character of fierceness which I never thought to have witnessed in the human countenance. They were past the utterance of what, if I might read the countenances, was unsubdued hatred, and desire of revenge.

On the second day, the temporary excitement had subsided. Turn which way I might, I encountered every form of entreaty from those whose condition left no need of words to stir compassion. "Major, O comme je souffre! pansez! pansez! Docteur je me recommande à vous, coupez ma jambe—O je souffre beaucoup, beaucoup, And when these entreaties were unavailing, you might hear, in a weak inward voice of despair, "Je mourrai; je suis un homme mort!" The tones were too true to nature soon

to lose their influence. At four in the morning I offered my services; and, at six, I entered on the most painful duty of my life, in inspecting and operating on these unfortunate men. I was thus engaged, uninterruptedly, from six in the morning till seven at night, for three successive days. There was now no time for improvement; the objects for which I had come abroad were laid aside, for it was necessary to put hands to the work. I was now convinced of the injustice of expecting information from those who, at such a time, if they have the common qualities of our nature, must have every faculty bound up in duty to the sufferers; cases, and observations cannot be drawn, a certain general impression remains, and the individual instance must be very remarkable that is remembered at all.

I know not what notions my feeling countrymen have of thirty thousand wounded men thrown into a town and its environs. They still their compassionate emotions by subscriptions; but what avails this to the wounded, who would exchange gold for a bit of rag! If men would encounter the painful reality, and allow themselves, for a moment, to think of the confusion that must attend such a scene; the difficulty of arrangement; the many, very many, cases where knowledge, decision, and dexterity, are more necessary than in any other situation of life: if they would consider, that, from the pressure of the time, the surgeon requires personal and constitutional strength,

as well as the promptitude gained by long study and experience: they would be led to inquire what duties had been performed, and what consideration had attended the unexampled exertions of the army surgeons after the battle of Waterloo.

Such have been the tenor of my expressions since the second day I entered the streets of Brussels; which, at that time, presented a scene of which the public can have no distinct conception: and such opinions I expressed to General Adam, then in command, as well as at home, and uniformly on all occasions.

For myself I must declare, that I never had pretensions to consideration on account of what was done at Brussels; which declaration may appear unnecessary, and, therefore, like the language of complaint, to those who do not know how current the report was in the army, both of my great pretensions, and of my having received unmerited reward.

The wounded men brought into the hospital called Gendarmerie, were in the most deplorable condition. While they were brought in at the rate of fifty in a morning, there was a counter current of the dead; from seven to fifteen deaths occurring daily. There was every sort of wound, of the head, throat, body, and limbs. They were principally inflicted with grape-shot, although some had musket wounds and sabre wounds; some had stabs or penetrating wounds; some had suffered contusion by the cavalry. But by much the worst cases, that is such as excite hopes in the

surgeon's mind, and disappoint him in the event, were the complicated fractures of the extremities; and these, with few exceptions, were of the thigh and leg, insomuch that it seemed as if those who were wounded in the arm, had been marched off, or made their escape. The wonder was, that so many had survived so long. Here was the thigh-bone shattered, and the end sticking through the integuments; there the knee-joint laid open, and the heads of the bones fractured, or the joint wounded, and many pieces of bone to be felt through the bag of the integuments. I amputated a limb, when both the knee-joint and ankle-joints were opened, and the fractured bones exposed. I had one poor man on the table to amputate for a wound of the knee-joint, when I discovered that the head of the femur was shattered in the socket. In very many cases, the femur, or the tibia and fibula, were fractured, and the whole limb stuffed and gorged with blood and matter. In others, the great vessels had given way by ulceration. In some, the bone was not only broken into many pieces, which could be felt within, but the ends of the bones were thrust through the integuments.

These gun-shot fractures, on the thirteenth and fourteenth day after the wounds were received, had a character not at once discernible. The whole extent of the limb had partaken of the swelling, but this proceeded from a different cause in different parts. The integuments near the shot-hole were thickened, tense, and an angry dark inflam-

mation extended around. In the muscular substance of the limb, in the ham, and in the calf, large purulent abscesses had formed. The more general swelling of the limb was œdema, proceeding from an infiltration into the cellular texture. It is very necessary to take all these consequences of delayed amputation into consideration, in order to comprehend fully the advantages of early operation, as well as to understand the situation in which I was placed on the occasion alluded to. When a limb is amputated in this condition, the hope of success is diminished in a remarkable proportion. There are besides, circumstances in the mere performance of the operation worthy of notice. For example, if constrained by the nature of the wound and the urgent demand of the patient for relief, to amputate the thigh, the knee joint being open, and the end of the femur fractured, and the swelling extending upwards; the surgeon, accustomed to common amputation, may be surprised into a situation of immediate danger to his patient. Although he has applied the tourniquet very firmly; yet before he has advanced so far as to make his incision on the muscles; the swelling has yielded, and the garter is loose. In such cases it is better to trust to compression of the artery at the groin; for to screw the tourniquet, with sufficient firmness, will injure the integuments, and, perhaps, embarrass the operator with bleeding veins, without arresting the blood of the arteries.

No adhesion can be expected from integuments thus loaded with exudation, that absolutely break like a pulp when you turn them down upon the face of the stump. Suppuration of the worst kind must ensue, and the patient sinks worn out with the previous inflammation, pain, and discharge; there is in the consequences of the amputation only a succession of the same causes of debility.

Another circumstance of importance in judging of the place of the incisions, is the extent of the abscess which forms in the fleshy substance of the limb; for without due attention to this, the amputating knife cuts across a large abscess, and the coverings to the bone are the walls of an abscess! I would not have it believed that such was the case in my operations, since it is a circumstance I have before explained*; but I found it necessary to open the abscesses before amputation, to evacuate the matter, and by means of the falling in and softness of the bag, to ascertain the sound place of the limb.

I think I must have performed twelve amputations; for where it was possible to relieve by incisions and the extraction of the loose and pricking bones, I need not inform my readers that I was satisfied with doing so. But there were many difficult cases of fractured skulls and aneurisms,

* Treatise on Gun-Shot Wounds.

which consumed much time; and the moment that an intelligent army-surgeon could be spared for this hospital, the object of my stay there was accomplished*.

Of the operations thus performed amidst difficulties the most appalling, and in a state of the patients the most hopeless, I indulged the expectation that some notice should have been taken in the returns. I pleased myself with thinking that at least one part of a great question might thus be determined, namely, the chance of success attending amputations performed in these desperate circumstances. I exceedingly regret that all my applications through the Board at home have procured me nothing but the returns from a single ward in the upper part of the hospital, in which none of my amputation patients had been placed.

Therefore, as to the success which attended these amputations, either much injustice has been done to me in withholding reports (of which I must add, I have myself no suspicion), or there is nothing known upon the subject. Notwithstanding,

* This hospital of the French wounded was, I have said, just forming in the most difficult circumstances. When I was there, it had not yet assumed the system of the other hospitals. It was the last hospital formed where full thirty thousand men had been accommodated, and yet there was no want of any thing essential, and the exertions of the medical officers were unremitting to bring it into order.

much has been reported to my prejudice; the story has been actively propagated, that I performed thirty-five amputations, and that out of these only five patients survived.

If I could believe that five of my patients survived of those who suffered amputation in the circumstances which I have related, the number would be unprecedented, for I operated only on twelve. My reader may be at a loss to know from what flattering comparison I draw this consolation. It is from the records of the operations performed in Spain. It is there stated, that after the battle of Salamanca the French wounded were brought in on the third and fourth day after the battle; in the course of the succeeding fourteen days, forty-six amputations were performed, on account of compound fractures, and the narrator says, "Of these I saved but six; and these six may truly be said to be saved." Now as every well-informed surgeon is aware of this great loss being a consequence of the period at which the operations are performed, this consideration relieves me from the pain of believing, that any of those gentlemen with whom I was in habits of communication, while at Brussels, could have raised this report to my prejudice. It must have proceeded from some witless amateur, who followed me to Brussels, and who, knowing nothing of gun-shot wounds, has propagated a statement which he thought might be to my disadvantage. I am not at liberty to blame

those who, by their silence, permitted the belief in this statement to prevail so generally.

OF EARLY AMPUTATION IN CASES OF SEVERE ACCIDENTS AND GUN-SHOT WOUNDS.

By having before us distinctly, the consequences of delayed amputation, we are advanced to the comprehension of the mystery which involves the question of early amputation. This is a subject that has been definitely treated by some authors. Our army practitioners have resisted acknowledging the precept, until conviction has come upon them by the slower progress of experience. It is, however, important to know, that on all sides, now for a very long time in the practice of the navy, in the practice of the army, in the practice of foreign nations, the rule is admitted, that early amputations are best.

But limited as the question has become, it is still encumbered with subtilties. The rule I apprehend to be—when the case is distinctly declared, amputate as soon as the flutter from the wound has subsided; and if the subject be a brave spirit, whose mind is made up to all changes, amputate on the instant. Thus when the Glasgow was going into action, on the late attack on Algiers, a man in the tops had his leg struck by a round shot, and although the limb hung by the

integument only, he run himself down a rope, and coming upon deck was carried below. Mr. Stenhouse, my old pupil, performed the amputation as soon as he was relieved from the operation in which he was then engaged.

It is suggested that, to ensure success, the limb to be amputated, should have become stiff and painful. We are unwilling to admit a rule which we cannot comprehend. Stiffness and pain are the immediate forerunners of inflammation; and the accession of high and extensive inflammation is attended with a shock to the powers of the constitution. We see men dying in the very attack of what would be acute inflammation. I venture to suggest the revisal of this decision, and, in the meantime, offer this rule. If a limb be wounded in such a manner as to declare the necessity of losing it, the sooner the amputation is performed the better. And this rule is not clogged with any exceptions in regard to what are called the periods for amputation.

If a man be brought to the surgeon, so immediately after the wound is inflicted, that he is stunned with his fall, or if he be still fluttered, and his pulse weak, and that not so much from the wound as from the general shock, a cordial and rest in the horizontal posture will prepare him for the operation. If a wound has been inflicted, that makes amputation absolutely necessary, and, from circumstances, it has been delayed until the inflam-

mation has arisen, are we to wait? I apprehend not. I acknowledge, it may be a question, and that the time is unfavourable, but, by delay, the danger will increase. I must forget the hospital of the Gendarmerie, when I acknowledge that the period of suppuration is the more favourable period for amputation. I think a false analogy has misled surgeons on this point. Amputations succeed in white swellings, and caries, when there is a mild suppuration, better than when suddenly performed after domestic accidents. But the suppuration which comes upon a gun-shot wound of *so great a degree of severity, as to declare amputation unequivocally necessary*, is a thing so formidable, that any previous time is better for the operation than this? for the suppuration is unfortunately not in the wound only, but in the muscular substance of the limb; and the inflammatory swelling never subsides, it is succeeded by œdema.

So far I have stated the rule of practice to the best of my judgment. On turning to authors, I ought to confess that I see many difficulties still embarassing the questions. I shall reduce the subject into the form of—Queries. I must, however observe, that the gentleman who has written on the subject of wounds, the best perhaps of any, is treated by some military surgeons very cavalierly. They acknowledge that his opinions were correct; but then they say nobody gave them weight, because he was not a military surgeon. This is not a becoming

sentiment. The discussion has now been entertained since 1756, and most of those who have touched upon the subject have claimed to be military men, and to have been unbiassed by doctrines. From this very assumption, and believing that it was only necessary to be correct observers, (while, for the most part, they have been pure theorists,) they have neglected what has been delivered by those who went before them; each has begun *de novo*, and has as certainly, in his own opinion, put the question to rest. The consequence has been, that the subject is still to be investigated, with the further difficulty of an accumulation of contradictory opinions. For want of a little scholastic discipline in aid of military ardour, the evidences stand arranged in opposite columns; and, when we seek to found on the authority of experienced military surgeons, we are jostled between them, and find no ground to rest on.

Queries.

A limb struck with round shot presents an uniform paleness, the blood having left the cutaneous vessels; it lies tranquil, and in a natural position, but cold and heavy; it swells and becomes œdematous, dark streaks appear upon the surface, and lancing pains soon begin to strike through the limb. Is this a true picture, or is it altogether imagination?

When a man is severely wounded, and stands in

need of an operation, do you find his cheeks cold, and his eyes fixed, and his pulse feeble?

If it be admitted that a limb which has been struck with round shot is in a state of stupor, as it has been called, how far does this numbness extend, and how is its extent to be ascertained?

Supposing that it shall be proved that there is a peculiar debility after severe gun-shot wounds, from what does it proceed? is the influence mental or corporeal? is it a state of alarm, and depending on the mind? or, is it a state of concussion, and resulting from the shake to the nervous system? is the shock given through the limb and communicated to the body generally, or is it from the falling of the body? or is it owing to the loss of blood?*

A variation in evidence may be expected from the surgeons of the land and sea-service. Should we expect this effect (supposing it to be proved to exist) greatest where the limb is clean cut off by round shot or chain shot, within half a cable's length, or even closer to the mouth of the cannon? or must we suppose the injury and shock to the limb to be

* When a man who has cut his throat is brought into the hospital, he is in a state very much resembling that which some authors have described as accompanying severe wounds. Though sensible, he is cold, pale, taciturn; and very often, although such men are desirous of living, they sink within twenty-four hours. This appears at first to proceed from a strong impression on the mind, but is, I believe, the consequence of loss of blood, and the shock thus given to the powers of life.

greatest when it is bruised by a cannon-ball fired from a piece which has been elevated, or when the shot has rebounded. Can this explain the difference of statement.—This account of coldness of commotion has come from the army surgeons, while the navy surgeons make no observations upon it, or seem to have disregarded it.

The first period for amputation is very indefinite. It is called the first moments of agitation; and in the same breath it is extended to six or eight hours; and again, it is said, that from one to three hours will be found sufficient.—Sufficient for what? —is it to calm the mind, or to restore the system, or to let the limb recover from the shock and vibration?

What measure have we of this first period? can circumstances lengthen or shorten it? what are the best remedies, rest and opiates, or cordials and excitations?

Is it sufficient that the wounded man be confident in spirits to undergo the operation, or have we something more to wait for?

Shall we wait till the wounded limb stiffen and become painful before we operate, or shall we hasten to anticipate the coming on of these threatening symptoms?

If the limb has partaken of inflammation, will the amputation be attended with fatal symptoms; and what are they?

Lombard, with whom much of this discussion

has arisen, operated on the English prisoners after the battle; and he calls this the first period, and, in his opinion, his patients died because they were too early operated upon. When the army surgeon speaks of operating on the field, does he not mean when the enemy have retired, or in a place out of cannon shot, and in the rear? The navy surgeon can operate within the minute, and in fact does "immediately." In the communications of our navy surgeons, the end of the third hour is called the commencement of the second period, while the second period, in authors on military surgery, is understood to be the end of the third week!

An army surgeon, fixing the first period for amputation, within the twenty-four hours, and even extending the time to forty-eight hours, gives us a most encouraging view of the success of operations performed within that period, his success being nine saved in ten; a navy surgeon is supposed to have lost nine out of eleven patients, who suffered amputation, because of the delay of four to six hours.* It is asked, what is the first period?

Does the question, so loosely treated, refer to

* I must protest against considering the cases of the Impregnable, before Algiers, as touching this subject at all, or as reflecting in any degree upon the surgeon; seventy men brought down at once, into an already crowded cock-pit, the thermometer at 140°., give rise to another course of reflections.

wounds by cannon-shot, grape-shot, and musket-shot, or only to the first?

Such is the present confusion of ideas on this subject. It is neither creditable to the surgeons of this country, nor to those of France; and no department of the profession has just claim of superiority; indeed, it is humiliating to find a question of so much practical importance, so long undecided, and the consideration may moderate us in every thing, but in the diligence of our inquiries.*

REPORT

ON THE USE OF THE NITRO-MURIATIC ACID BATH, IN CERTAIN OBSCURE CASES OF SYPHILIS.

When a poor creature is reduced to great weakness, despairing from long suffering and disappointment, covered with scabs and ulcers, and loathsome, and rejected of his friends. When such an object, half poisoned with mercury, and still suffering from syphilis, or its sequelæ, presents himself, what a relief is it to be able to take a middle course: to possess a remedy which, without further weakening the powers of life, can clear the skin, and dry up the ulcers, give animation and colour to his countenance, and thus enable us to return him to society. What although witnessing such effects of a remedy,

* In a future Number, a catalogue of the fractured bones in the Museum, will be given, with remarks on the proper cases for amputation.

we were to be left disputing about the action of the medicine, or the nature of the disease—of how little real consequence is this difference of opinion?

The statement of the cases which I now lay before my reader, in which the nitro-muriatic acid bath was used, will show that I have not overcharged the picture, or added any thing from imagination. They are all hospital cases, drawn up by dictation to the students of the hospital, at the bed-side of the patients. And here, in justice to the subject and to myself, I must observe, that many occasions offered in which I might have put this remedy more distinctly to the test as a cure for syphilis. But, having a perfect reliance on the effects of mercury in all pure cases, I have not permitted experiments to be made. I have used the nitro-muriatic bath only in such cases as were rendered obscure by mismanagement, or in which mercury had been inefficient or hurtful; in short, where I was really happy to find a substitute for a doubtful, slow, and expensive mode of cure.—Let it be said that a well-regulated course of mercury, or, that sarsaparilla, milk diet, and country air, might have produced the same effects that we have witnessed in these cases; yet is it not satisfactory to find that the poor mechanic may be cured upon easier terms? and that we do not require to send our patients to hold a Tusculum to get cured of the pox? I must, however, beg my reader to understand, that I am not offering a substitute for mercury in syphilis, but only a mode of removing a very

disagreeable train of symptoms. Indeed, I am conscious that the subject requires a few introductory observations, were it only to limit the object of this paper.

It is not my purpose to enter upon the investigation of the fictitious diseases, as they have been called, nor to object to the names which have been given them, nor to deny the existence of new diseases; but I must express my belief, that the subject of Pseudo Syphilis has acquired an importance, from the multitude of cases of syphilis improperly treated, which offer themselves in public institutions. We find practitioners screening themselves under the authority of great names, and believing themselves to be blameless, because dealing with some new form of disease, when, in fact, they have mismanaged a common case of syphilis. Whatever advantage hereafter may accrue from the new opinions, they have, in the meantime, encouraged great negligence and irregularity in the treatment.

On slight suspicion of infection, small doses of mercury are given, which control and change the signs of the disease without curing it, and hold its virulence suspended, or weaken the attack. The improper treatment of the primary sore is another source of error. They attempt to destroy it with caustic, or they apply escharotic and stimulating dressings, while they load the system with mercury. By local applications the hardness of the ulcer is kept up, and the mercurial course is pushed with the design to destroy the hardness;—then

comes mercurial sore throat, and they have entered the labyrinth! Instead of waiting to observe the character of a sore, and avoiding every thing which can change its aspect, they engage in a mercurial course before they have ascertained the disease. It may happen that mercury aggravates the disease, and they attribute to the progress of syphilitic poison, that which is the consequence of the remedy. Another source of error is from pushing the mercurial course, when either the disease is not in a condition to be cured, or the health is so reduced as not to be able to withstand the remedy in that degree necessary to overcome the disease. The opinion that mercury will certainly overcome the true syphilitic disease, if given in sufficient quantity, leads, in the first place, to very severe trials of the remedy, and to the conclusion, that it cannot be the disease which remains or returns, after an interval of health, in a new form. The symptoms are therefore trifled with, and treated with small doses of mercury, which tend to suspend, and not to eradicate the disease. Scrofulous complaints will sometimes be excited, which give rise to mistakes. Often a scrofulous swelling of the glands of the groin will be excited by venereal virus, which mercury is unable to subdue. Scrofulous ulcers of the amygdalæ occur during a course of mercury, being excited by the remedy, and these also lead the surgeon into the most serious mistakes.

A question is often put to me in the wards;—are we to continue and increase the quantity of

mercury when smaller doses have removed the symptoms and restored the strength?—In answer to this I must offer two examples.—When the disease has long prevailed, where much mercury has been given, and the constitution has been injured, you cannot with safety load the system with mercury. In these circumstances, by joining the sarsaparilla with small doses of mercury, and by other attentions to the patient's health, he recruits and becomes fat; and if with this the symptoms have disappeared, you have reason to leave off the mercury. If the disease should break out again, you have gained a great deal; for now he is in a condition to submit to a mercurial course, which may be effectual. But, to return to the question; if a recent case offer, and the patient be out of health, and if, when you administer mercury, and it begins to shew its effects on the gums, his pains and weariness be amended, and the countenance get clear, it is an additional motive to push the remedy to salivation, and to keep up its influence to that degree, and for that length of time, which is necessary to eradicate the disease. In pursuing this plan, the health, which was at first amended, will decline; but this we expect, and we must manage and persevere.

These are some of the causes why syphilis shews itself weakened, almost worn out, but not extinguished, liable to break out in circumstances favourable to its development, but still in a state to be subdued by the lesser remedies; and, in the

meantime, the patient drags a wretched existence. These too, are some of the causes why so many patients are seen, whose constitutions have been destroyed by repeated long courses of mercury, which seem still to have been given ineffectually, since the patients are covered with sores and cutaneous eruptions.

Case of John Bassham, Pyke's Ward, September 25, 1816.—The following case is nearly in the patient's words :

The first appearance of my disorder was before Christmas last. I had then a discharge, and the foreskin almost closed. I first used a white wash, and then I injected a black wash, betwixt the nut and the tight foreskin. At the same time, I took three mercurial pills every day ; I continued taking them for three or four months. I had no sore upon the penis at this time, nor have I had since. I rubbed in mercurial ointment for three days. My mouth was not sore at any time during the three or four months I continued to take the pills. Before I had ceased taking the pills some eruptions broke out upon my face and on different parts of my body, and I had at the same time pains in my bones. My eruptions soon after broke out into sores, and then I applied to another surgeon, who cured them by bleeding me. He bled me eleven or twelve times, and gave me Goulard wash to my face. I continued under his care till he sent me to the hospital.

This patient has a sore on the calf of the leg,

which appears as if the piece had been bit out of it. It is deep, with sharp edges. Within it is foul, with a bloody yellowish slough. The whole of the left cheek, part of the right, and the forehead, is covered with a dry eruption ; the skin under the crusts is red and tuberculated. The extremity of the nose is in the same manner disfigured. A great part of the upper lip has been eaten away with ulceration ; the sore is now dry, but covered with a scab. On his forehead are projecting scabs surmounting ulcers, which still discharge and accumulate secretion at the base of the pyramidal scab. He has a sloughy sore on his arm. And besides the scars on several parts of his body, he complains of pain over the ulna, which is increased when in bed. He has also pain on the side of the head and face. His face is remarkably pale, and he appears much reduced. It appears that he lost a great deal of blood from the ulcer on his lip, having opened the labial artery. After this event he thought himself better, and it was this circumstance which led his surgeon to pursue his cure by bleeding. He says that he was better for these bleedings, but caught cold, as he imagines, which brought him to his present condition.

On being admitted, he was ordered to use the nitro-muriatic bath morning and evening, and to take a pint of the decoction of sarsaparilla. He had only used the bath a week, when there appeared an evident amendment in the sores. An unusual fulness of the belly occurred about the

end of the second week. It was at first supposed to be tympanitic, but by-and-bye fluctuation was perceptible. The bath was at this time suspended, and three smart doses of calomel and jalap were given. But there being reason to attribute this dropsical swelling to the previous loss of blood, the bath and the sarsaparilla were resumed.

Oct. 18, a pill of calomel and rhubarb has been given to him when the bowels were confined, and the chalk mixture occasionally, when the stools have been loose with pain ; but the bath has been persevered in. His pulse is fallen, his appetite is better, and the roughness and tuberculated redness of his face is much diminished.

Nov. 11. The sore at the angle of the mouth is healing; the forehead and face are clear of all foulness ; a hole on the right side of the nose communicates with the cavity, but its sides are healed. The ulcer of the leg has filled up, and appears clean and healthy. The bath is still continued.

His feet were immersed in the tepid acid bath, for twenty minutes, morning and evening. The sore on his leg for a long time prevented him from putting the leg deep enough into the tub. The skin was therefore washed and sponged with the fluid. The scabs were thrown off, the sores under them healed, the deep ulcers became clean and healthy, and filled up, the dropsical swelling of the belly disappeared, and on the 27th of November this man was dismissed entirely well. On the 10th of December, Mr. Shaw met him, and then

he declared that he was perfectly well, and a stronger man than he had felt himself for years.

November 13, 1816. *Thomas Goldthorpe, re-admitted. Pyke's Ward.*

About twenty-seven months ago, he had a sore upon his glans, which appeared twelve or fourteen hours after connexion. He says it had the appearance of the skin being rubbed off; he applied something to it which he got from an apothecary, and by which the sore was healed completely in ten days. No hardness remained afterwards, as far as he can recollect, nor has there since, been any trace of the sore. About three weeks after the healing of the sore, a number of pimples appeared on his back which had matter in them—these soon broke, and from the irritation of his clothes, became sores. At this time also he had a sore throat—for the cure of this he went to Norwich; they would not admit him into the hospital, as they conceived it to be a venereal case, but made him an out patient—he says they gave him mercurial pills, and made him use mercurial ointment: the quantity of ointment which he used every night, he describes as a very large quantity, not less than ℥ss; but his mouth was never very sore, nor were his bowels affected; though an out patient of the hospital, he was confined to his room, and was visited by a surgeon; in six weeks, his sores and throat got well; but at this time having been out of his room for two days, the sores again appeared on his legs, and quickly spread to the other parts of his body. He

was again confined to his room, and remained confined seven weeks longer, during which time he was constantly using mercury, but the sores were gradually getting worse.

He then came up to the Middlesex Hospital. He came in on November 29, 1814, and remained in till July 1815; during this period, some of his sores got well, some better, and others worse. On referring to the book, it appears that he took besides bark and nitrous acid, Pil. Hydr. cum Opio. ii. o. n. for six weeks, and afterwards, the Hydrargyri Oxymurias in Solution. His mouth was never sore with these medicines. Being very much reduced in strength, he went down into Yorkshire to his native air. In the course of seven months he got pretty well. During this last period he used no mercury—he only applied some ointment to his sores. Some of the sores, he says, healed without ointment while in the Middlesex Hospital; these, he says, have always broke out again, while those to which the red ointment was applied, have remained sound. When he had been in the country about eight months, his sores healed; but at this time the skin on the bridge of his nose became red, gradually thickened and spread to his forehead, cheeks, and lips. Very shortly after the commencement of this attack on his face, his sores again broke out. A surgeon in the country gave him a wash for his face, which he says made it much better; he gave him also pills, twenty of which he used to take in a day; these, the surgeon told him, were not mercurial. During the time he took these

pills, some of the sores healed, others broke out anew; but, upon the whole, he must have been getting better; for, he says, he is sure the surgeon would have cured him, but that he could not afford him sufficient money. Upon this he came up to the Middlesex Hospital again.

His face is very much disfigured by a red swelling of the nose, forehead, and lips; the skin of the lips and nose is very much thickened, but not hard; the skin of his forehead is so thickened, that it stands out prominent. To the touch it has something the feeling of a nævus maternus, or as if there was a quantity of serum effused within the substance of the cutis. All this thickened part is studded with pimples without heads. His back is, in many parts, covered with patches of skin of the same nature; but the pimples, apparently from the irritation of the shirt, have suppurated and formed scabs. On his shoulder and neck there is the same appearance. On his right ulna there is an exostosis of an inch in diameter; it appears to have a cavity, for the apex or centre is soft. His clavicles feel irregular; his tibiæ are not at all affected. On many parts of his body, the scars of former sores are seen, covered with white skin; he has also a sore throat. There is a superficial sore on his right tonsil; and, on the left side of the pharynx, there is an ulcer, which has something of a venereal appearance: little red points appear through the foul matter. The patient is thin; but his strength is not much reduced.

Nov. 17*th.* Yesterday Mr. Joberns ordered him to rub in Ung. Hydrarg. ℥i. o. n.; but, at Mr. Bell's request, he has given that up, and is to let this patient have a fair trial of the bath.

18*th.* He has had his feet in the bath, and has also washed his sores with the diluted acid. His face appears a little better, and some of the sores, on his back, have improved. He has, to-day, shewn me his left testicle, which is very much swollen, and hard and irregular. He says about six months ago it began to swell, without any apparent cause. There was considerable pain at first, and the swelling was very considerable. He had no gonorrhœa; for the last twelve months he has been obliged to get out of bed three or four times during the night, to make water: but I do not find that he has any other symptoms of stricture*.

19*th.* Was in the warm bath last night. His face does not appear so gorged; it is becoming scaly. There is no change in his throat. Pulse 70.

24*th.* Very little change since the last report.

28*th.* He has been ordered to omit the bath for two days, as he has been using it so strong, as to form small pimples; but his face and back are both evidently better. His mouth feels slightly sore, and he has some degree of head-ach.

Dec. 1*st.* He is again using the acid very weak, and sponging himself all over.

* See further on the Disease of the Testicle induced by Mercury.

8*th*. His sores are very much better; his face is not nearly so red; he spits a good deal, but it is "a dry spittle;" his mouth feels sticky and clammy, and the taste something like metal; his throat is very nearly well.

10*th*. Dr. Scott visited him to-day with Mr. Bell. On being asked how he was, he said finely. His sores are healing rapidly; his mouth clammy and metallic; the bump on his ulna is unchanged.

16*th*. He is quite delighted with his progress; his back is nearly well, and his face is very much cleaner; he has the husky taste in his throat. The tumor on his ulna has not varied much; it appears larger, and the centre softer.

24*th*. Nothing to remark since the last report, except that he is getting rapidly well. All the sores are nearly well now; his throat has been perfectly well for some time. He shewed me to-day a slight swelling over the flexors of the right wrist; it appears to be muscular.

Jan. 1*st*. This man is getting rapidly better, and he is now fat. Indeed, since the 28th of November, the case has been getting progressively better. He has taken no medicine, but a few doses of the house cathartic. He is now strong, and quite delighted with his progress.

4*th*. There is only a very small part of his shoulder which is not healed. The redness of his face is disappearing; the swelling, or exostosis, on his ulna, has changed its character very much; from being larger and softer, it has become much

less, and the general swelling that was surrounding it, has abated. He cannot say exactly when the pains in his shoulders ceased; but he has felt no pain, in any of his bones, for a considerable time. His testicle is decreased in size, though there is still a considerable degree of heaviness and hardness in it.

12*th*. This man may be now said to be perfectly well. There is not, on any part of his body, the smallest sore; they are healed by firm cicatrization. I asked him if he wished to go out; he said, he felt perfectly well, but would not go if it was thought proper that he should remain longer, for he had suffered for three years, and he now wished a good foundation. The testicle is much better; and the tumor on the ulna subsiding. There has been a difficulty in saying exactly, whether the diminution of this exostosis be owing to an absorption of bone, or of soft parts; for it is now very distinctly to be traced from the ulna, which was more obscure formerly. His face is nearly reduced to its natural appearance. A few days after this report, the patient, tired of confinement, and feeling himself quite well, sought leave to go out, and did not return.

Joseph Bray, aged 22, a sailor.—About three months before he applied for admission into the hospital he had a small sore on his penis. He was, at this time, at the Cape of Good Hope. The surgeon of the ship ordered him to use, by

friction, 3iss. of mercurial ointment every night, and to wash the part with Goulard water. About a week after he began this process, a bubo arose. It was brought to suppuration by poultice. He continued the use of mercury, by friction, for a month. He was kept constantly below; but his mouth never became tender: the primary sore, however, was healed, and the bubo was better. His surgeon now told him, that he had got enough of mercury; and he attempted to heal the bubo by a black wash and red precipitate dressings. He was kept below for two months more; and, about the tenth week of his confinement, he began to feel his throat sore. After three months confinement below, he came upon deck, here he caught a cold, and then came a swelling in his arm-pit. He now got on shore; the swelling increased, attended with inflammation, which extended to his chest and back. The open bubo began to enlarge, and his throat had got considerably worse.

He went to a quack doctor, in the Minories, who gave him a poultice, two large pills, and a hot mixture; finding himself no better, he came to the hospital 8th of July, 1816.

When examined, he had a sore throat, a large spreading abscess in the axilla, and a spreading bubo. He never had any spots on his body, or pains in his limbs. He was ordered the oxymuriate of mercury, in solution; under this the sores got worse. He then used 3i. of mercurial ointment, by friction, every night; and, by this means, his mouth

was made very sore. A gargle being, at the same time used, his throat got well; but, in the meantime, the sores spread, and the mercury being decidedly in his constitution, it was found, that, on the whole, he was considerably worse than when he came into the hospital.

After being nearly three months in the hospital, and having taken the sarsaparilla in great quantity, he was put upon the use of the nitro-muriatic bath. Having used it for some time, it was by mistake, made so strong as to burn his feet, and they became quite yellow. At this time the sores changed their aspect; or, to use the patient's expression, as soon as it took effect upon my feet, it took effect on my sores; and, he adds, that never any thing changed the colour of the sores before. The bath was omitted for a few days, and resumed, very much weakened. He continued its use for upwards of a month; and, from the time the sores changed their colour, they began to heal.

The sores and sinuses in the groin healed first; they healed in a manner to show the good effect of the bath; and it was evident, that the sores in the axilla, were kept open by the motion of the part. The axilla was then dressed simply, and the arm was bound to the side. After almost all was well, there remained a small portion without cuticle; which, by the use of the lunar caustic, healed. This patient remained a month in the hospital after leaving off the use of the bath. He was thin when he left off the bath; but his skin was clean and healthy. Before he quitted the hos-

pital he had become fat and round in his limbs, and his complexion perfectly natural and healthy.

Pyke's Ward, Jan. 5.

——— *Baldwin*, aged 25. In April, 1815, he had three or four sores on the penis, attended with phymosis for eight weeks. By the time they were exposed by the retraction of the prepuce, they had eaten under the corona glandis. He rubbed in mercurial ointment, and they healed completely without any local application but milk and water. He thought himself well, but two months after this, he began to have scabby eruptions on his forehead. For this he took the decoction of sarsaparilla with corrosive sublimate; the medicine had no effect on his mouth, and the eruptions continued their progress. In December he began a course of mercurial friction, which he continued for six or seven weeks; he rubbed in a portion of mercurial ointment, the size of a nutmeg, before the fire every night. Still his mouth was not affected. At the latter part of this course, he took two mercurial pills at night, and one in the morning. This was followed by a diarrhœa, which reduced him very much. He now left off the use of mercury, and took lodgings at Kentish Town; here he remained till the end of May, drinking a bitter decoction, and the eruptions and sores all healed, except that above the right knee. He went at this time into the country, and resumed the decoction of sarsaparilla. In July he began to get worse, but became again better, by resuming the alterative course of mercurial pills. In the beginning of

November he left off the pills, but continued the use of the decoctions. From that time he fell worse.

This is his present condition. He has eruptions and sores all over his body. One sore on his shoulder is open, which has been twice healed. There are several other sores on his body; of these the edges are abrupt, irregular, and defined; within the margin they are very foul, with a reddish yellow secretion coagulated on their surface. There is a large ulcer on the outside of the right thigh, of the size of the palm of the hand; its upper margin appears stationary; the lower is abrupt, sharp on the edge, and foul or sloughy; the edge of the ulcer is of a blood-red colour. The eruptions are in patches, from the size of a common pimple to the breadth of the point of the finger; flat, copper-coloured, irregular spots are betwixt the elevated eruptions. The elevated spots are thus described: they are of a deep lake colour, a little elevated; their margins are irregular, the centre has white matter in it, which dries and scabs. He has been ordered to put his feet into the nitro-muriatic bath every night, and to sponge his body with the same.

9*th Jan.* The many sensible sores on his legs prevent him immersing his feet fully into the bath. He has an extensive foul sore above the ankle of the right leg. The large ulcer on the thigh is sloughy towards the lower part.

14*th.* The sore on the right thigh looks clean and healthy, and begins to have fresh granulations. The sore on the left shin looks very ill, being of a

dusky red colour, and often bleeds. The sores are washed with the bath weakened.

19*th.* The spots have faded, and have lost their former freshness and prominence. The large sore on the right thigh is clean ; its whole margin is upon a level, and the surface presents uniformly firm red granulations. His countenance is improved, and the purple eruption diminishes.

1*st Feb.* The sore on the thigh is much diminished ; the sore on the shoulder is healed ; the face is much improved. It is only by referring to the first Report that we can recollect the appearance of the eruptions ; the copper-coloured spots, however, which intervened, are not altered. He is ordered to bathe the legs twice a day.

10*th Feb.* He continues the use of the bath, and is altogether much improved ; the broad sore on the thigh is diminished to the size of half a crown. The sore on the ankle is the only other one which remains open. The crusts have fallen off his face. He complains of want of sleep ; the weather being unusually fine, he is to sun himself in the garden, and to take exercise twice a day.

22*d.* He is salivated ; the saliva pours from his mouth, and his gums are red ; but there is little soreness and no fœtor. A small scab still remains on his forehead ; the others have fallen off, and the sores are healed.

26*th.* I shall now discontinue the use of the bath, and give him bark, with milk diet.

John Tarret. (Attended by Mr. Shaw.) Taking the patient's account, it appears, that a month

later than the usual commencement of the primary sore from infection, he observed a small ulcer at the junction of the frenum and prepuce, and at the same time there arose a swelling in his groin. The sore was dressed with basilicon ointment, and he used the mercurial ointment by friction for three weeks. This did not make his mouth sore, nor salivate him, but the sore healed, and the swelling subsided. In October, which was six weeks after the healing of the sore, he had pains in his joints, so that he could not use his arms: the pain was worse at night, and attended with great perspirations. This, he says, was called, by his medical attendant, a rheumatic fever. At this time glandular swellings, which had long subsisted in his neck, became active and painful: they broke, and little sores at the same time formed upon his legs, on his shoulders, and back. There was a swelling of the right ankle, and he had pains of the shins and shoulders, which were worse when he stood near the fire. He never had a sore throat during this illness.

This patient is very weak, and confined to bed: many of the lymphatic glands of the neck, and about the jaw, are enlarged; some of them are in open suppuration. His countenance is scrofulous. His legs are covered with an eruption of the appearance of venereal lichen. His shoulders and arms are also covered with the same eruption. These eruptions are in all stages, some forming, some fully formed, others wasting and scaly, and, in some places, there is a distinct copper-coloured blotch left. Some, by the irritation of the clothes, have become sores. His knee and ankle are slightly swollen.

Mr. Shaw, witnessing the good effects of the nitro-muriatic acid bath, in the cases already described, and which were then under treatment, and dreading the effect of mercury in a constitution so distinctly scrofulous, put the patient on the use of the nitro-muriatic bath.

He began the use of the bath on the *7th. Dec.* —On the 13*th.* he began to feel a roughness and disagreeable taste in his mouth.

16*th.* The soreness and taste in his mouth have increased ; the eruptions are evidently dying away.

20*th.* He is better ; the legs are better, but one or two new pustules have arisen ; he feels stronger ; his countenance is improved. 23*d.* The sores are getting well rapidly.

Jan. 2.—He is no longer sanguine in the effects of the bath ; he has had a slight attack of fever, accompanied with pains in his shins, which are very severe at night. 12*th.* The eruptions are much better than when he began the use of the bath, but they do not continue to improve. 18*th.* The feverish symptoms continuing, the bath is omitted, and he is to be treated with Dover's powder and saline mixture.

Feb. 4*th.*—The febrile symptoms having abated, he was again put under the influence of the acid.

22*d.*—He has been losing ground ; he is worse than on the *7th. Dec.;* he is now put upon sarsaparilla and an alterative course of mercury.

Remarks on the foregoing Cases.

The four first cases, had all something in common ; and the effect of the acid upon the ulcers

and eruptions, was most remarkable; the amendment being uniformly progressive, and the cure complete. But in the last case, the same plan of treatment had no permanent good effect. It will be noticed, that in all those cases, in which the bath proved to be of such advantage, there had been a great deal of mercury previously administered. I have prescribed the use of the nitro-muriatic acid bath to several out patients with remarkably good effect; and these were patients who had been so long on my list, that I was heartily weary of them. One young man had ulcers and sinuses on his thigh, who went through all the usual course of medicine, such as the decoction of sarsaparilla—alterative doses of the blue pill—the Plummer's pill, with bitter infusion—the corrosive sublimate in solution—decoction of bark with soda; besides dressings of various kinds, and compresses and bandages. He returned to me month after month without amendment; but I found that three weeks of the use of the bath to his feet, and washing the sores with the water of the bath, made him entirely well. Several young women having eruptions and sores upon their legs, have got well by using the diluted acid; and these have been such sores as we term suspicious, which, if we were borne out by the history, we would send to the Syphilitic ward.

A question naturally suggests itself: Is the acid bath acting here as a lotion? Undoubtedly it is powerful as a lotion to certain eruptions and sores. But we have seen the eruptions and sores fade and disappear, when the bath was used to the feet

only. Again, there are very obvious constitutional effects arising from this bath: it produces bilious stools, oppression, and head-ach; the patients become thin from the long use of it. We have seen salivation and sore gums produced in two instances. Uniformly after its use, the patients have become more plump, and confessed themselves better in health: it will sometimes bring on the menses, or make them more profuse.

We shall have further occasion to speak of this remedy. We owe it entirely to Dr. Scott; and I shall subjoin some observations of his, upon the manner of using it; although he has been employing in very different complaints from those which are detailed here.

OBSERVATIONS

ON THE USE OF THE NITRO-MURIATIC ACID BATH, BY DR. SCOTT.

I have for some time past used three parts of nitrous acid, mixed with one part of muriatic. I am doubtful if these proportions of the acids are the best that can be employed. We know far too little of the theory of the effects of this compound on the human body, to be able to depend on any reasoning. I have of late for myself, and with others, used *equal* parts of the acids, and have, I think, derived as powerful effects, and probably still more powerful, in this way, than when the former proportions were employed. The proportions then of the acids, and many other circumstances, must be left to future experience.

On the mixture of the acids, a great volume of

elastic gas is disengaged, which is extremely offensive, and which soon pervades every part of a house. In order to avoid this, the acids should be diluted with about twice their bulk of water. Put, then, the necessary quantity of water into a bottle or other glass vessel, and pour on it the acids, one after the other. This may be kept for use in common wine-bottles. It is, however, generally right to have this diluted mixture of the acids made by the Apothecaries or Chemists.

I have frequently in India exposed the whole surface of the body below the head, to the action of this Acid Bath. I have however found in this country, that it is generally sufficient to *bathe the legs to the knees, or a little above them.* Get a wooden tub, just large enough to hold the feet at its bottom, and at top to contain the legs or knees. The bottom of such a tub should be wider than its top, for it is desirable, that in addition to the feet and legs, it should hold as little fluid as possible. If larger, the Bath will be less easily warmed, and the expenditure of acid will be greater. To such a tub as I have described, a quart bottleful of the before mentioned acid mixture may be sufficient. This rule however is not enough, for the acids vary much in strength at different times, and the skins of people are affected differently. The taste affords another method of judging. The Bath should be about as sour as weak vinegar, and it should prick the skin a little, though not much, after being exposed to it for half an hour. If stronger than this, it will produce troublesome pimples, and give a

yellow colour to the nails and the skin of the feet, all of which should be avoided. A common wash-hand bason does very well with some people for bathing the feet, sponging the legs at the same time.

The Bath should be made agreeably warm by pouring into it a sufficient quantity of boiling water. In order to warm it, I have commonly thrown out about a third or a fourth of it, replacing the loss by boiling water and a little fresh acid. This is perhaps the best method; but I have at times warmed it in glass or well glazed vessels of earth. This should not be done often, for it probably injures the Bath. I am not now convinced that a particle of *acid* enters the system! The effects arise, I suspect, from chlorine alone.

I was long anxious to procure a substitute for mercury, and for many purposes I found it at last in the Nitro-muriatic acid Bath. I have already in London seen enough of it to conclude, that it is not less efficacious than in India, and that it is capable of relieving, or of curing a great range of diseases; nor do these recent observations rest on my authority alone. If I can overcome the unwillingness of the medical world to try so new a remedy (and I cannot charge them with unreasonable scepticism in such a case) a confirmation of what I have asserted will appear in time from many quarters.

I shall only take notice at present, for it is particularly necessary, of a class of derangements which are very common. They are called *bilious*, and arise from the biliary secretions being too abundant,

deficient, or depraved. Hence are produced disorders of the stomach, giddiness, feverish heat, and pain of the head, restless nights, cramp, melancholy, and many of those unhappy feelings to which the term nervous has been applied. In such cases, let the patient sit in the tepid N. M. Bath for the legs, one hour or less according to circumstances, every night, or every second night. With some of these biliously disposed people, the first bath, and in a few hours, produces decided effects. It purges, gives rise to the expulsion of dark-coloured fæces or bright coloured bile, or bile of a brown, a green, or black colour, like tar mixed with oil. The pulse becomes quicker than natural, and a degree of restlessness takes place. These effects may be kept up for a number of days. They however are often much longer in appearing. Where the bile is deficient in quantity, the effects of the bath are only known by the fæces returning by degrees to their natural colour, and by a gradual improvement of the health. With people disposed to bile, it is necessary to keep the bowels very open during the use of the bath; for one of its effects, as I have said, and on which much of its beneficial tendency depends, is to produce a flow of bile into the intestinal canal. The immediate consequence of this is a feeling of being bilious, such as head-ach, giddiness, &c. &c. which should be obviated by laxatives. Those inconvenient effects of the bath arise from the very powers which enable it to correct some depraved conditions of the stomach and biliary organs. Although this bath, with little disturbance, produces many

happy effects, let it not be supposed that delicate, or even strong people, suffer no temporary inconvenience. Let it always be recollected, that the advantages produced by it can never be fully appreciated until the patient has given up the use of it for a considerable time. Even those who feel no very sensible effects from it at the moment, generally, in the end, find their health improved. The great remedy at present for bile is calomel, or mercury in some form; but this it is necessary after a time to repeat. The very same thing is true of the bath. When the bilious feelings return, it must be repeated. Patients must themselves discover how long they can go on without its use, and when they return to it, two or three bathings of the legs will generally be found enough to bring relief. If the bath were used cold, it would produce the very same effects as when tepid; but I recommend to warm it, for in this climate it might be inconvenient, expecially in winter, to use it otherwise. Sponging the body with it has the very same effects with bathing in it, as I know from experience. For this purpose, put some hot water into a wash-hand basin, with a proper portion of nitro-muriatic acid, and sponge the thighs, legs, and abdomen, for fifteen minutes daily; or these parts may be sponged alternately.—*Nov.* 9, 1816.

For sponging, the acid should be still more diluted than for bathing. The common error is making it too strong in both cases.

END OF PART III.

Surgical Observations,

&c. &c.

REPORT

OF CASES OF THE ACUTE FUNGOUS TUMOUR, OR SOFT CANCER.

THE perusal of these cases will convey to the reader an impression of the formidable nature of the disease called *soft cancer*. This tumour is by much the most terrible to which the human body is subject. It begins by imperceptible degrees, and long before its dangerous nature is indicated by symptoms, the patient is lost beyond remedy. The surgeon, on examining a tumour neither painful, nor attended with uneasiness, nor even inconvenience, has the painful task imposed upon him of announcing to the patient the necessity of immediate amputation; a decision which to the patient appears as unreasonable and unnecessary as it is sudden. But we have still more to lament the uncertainty of the prognostic; for as far as I am able to determine, after recurring to these cases,

the surgeon is not authorized to promise security even from extirpation of the tumour, although promptly executed, or from the amputation of the limb in which the tumour is seated. However this may be, it is obviously of much consequence for the surgeon to be able to distinguish this tumour from others of comparatively a milder or harmless nature.

This is a disease unfortunately so common, that under various denominations it has been known to every experienced surgeon. We trace it in our most valuable collections of cases under the title of *anomalous tumours**. We find cases of it by Mr. Else, under the notion of the tumour being produced by a *bursten vein*†. We find it called *false aneurism* by some; and Mr. John Bell has to my knowledge described, under the name of *aneurism by anastomosis*, tumours which belong to this class. The aneurism by anastomosis is a fungous bleeding tumour; but it is purely a local disease, and does not, like this, universally taint the system. In the cases delivered by that most intelligent and meritorious surgeon, Mr. Hey, than whom surely no one has to boast a more useful life, we may trace this disease in its most formidable characters. We owe much to Mr. Burns, of Glasgow, and much also to the valuable treatise by Mr. Wardrop.

Perhaps a more scientific name might be given

* Edinburgh Medical Essays, vol. i. p. 188. Medical Museum, vol. ii.

† Medical Observations and Inquiries, vol. iii. p. 169.

than soft cancer; but it corresponds with the destructive nature of the disease, and at least conveys to the unfortunate patient an idea of danger which may lead him more readily to submit to the decisive measures which are necessary for his safety.

The term spongoid inflammation has no other recommendation than the merit of him who used it; and the name of *fungus hæmatodes* neither accurately corresponds with the character of the disease, nor serves to convey an idea of it sufficiently alarming. The bleeding from these tumours is in a great measure an accidental circumstance; and it is not the growth of a fungous tumour, which is alarming, but the propagation of a disorder fatal to life.

In all these cases which I have published, the patients were of an age and of a constitution which would have inclined me to say they were scrofulous; and this is at the same time saying that they were not of the age or constittuion which we find subject to cancer. Indeed, the disease has few points of resemblance to true cancer, unless it be the manner in which the tumour spreads, converting every structure into its own nature, and the manner of its becoming ultimately a constitutional disease, and attaching itself irregularly to remote parts of the body.

It is a morbid structure that begins in a part which has been injured, but at a time long after all the usual consequences of violence have subsided. In this it resembles both scrofulous and cancerous

action, which often take their seat in parts debilitated by injuries. This circumstance would lead us to believe that a secret disposition must prevail in the system which is accidentally developed into activity by the injury of the part: and like diseases which we find consequent upon injuries, it will sometimes shew itself independent of such injuries, and as we may say, spontaneously: but, although spontaneously produced, the constitution shews no prevailing taint of it previous to the local affection, nor until a certain maturity of the local disease.

The peculiar morbid action prevailing in the tumour, does not propagate itself by the course of the lymphatics, nor can we say that there is any thing absorbed: for if lymphatic glands become diseased after the tumour has declared its nature, it will as readily occur that these glands shew themselves in a direction contrary to the course of the lymph, as in the tract of the absorbents from the tumour towards the heart.

All these cases furnish examples of the rapid course of this disease; so that I am inclined to term them instances of *acute fungus hæmatodes*. In this respect they differ from some examples which have been communicated to me of tumours called fungus hæmatodes, which have been attempted to be extirpated many times, and where the patients have survived some years. I have happened to find these tumours deep seated, and therefore, perhaps, the first stage of the growth of

the tumours has borne no proportion to the rapidity of their after progress. Indeed, their course and their alarming effects on the constitution induce me to consider them as belonging to the most formidable and most rapidly mortal disease of all which come under the care of the surgeon.

It is very important to know the early character of the tumour; and I think the authors who have treated of this disease have dwelt chiefly on its appearance in the latter stage. In the beginning, and whilst the tumour is deep, I know not how its nature can be determined; but when it becomes prominent, it is peculiarly tense and elastic. In its progress it is not uniform; but having projected in a small hemisphere, another of corresponding form and dimension rises beside the first: in succession another lobe or division is produced; and so it proceeds, until the tumour has assumed a very formidable magnitude. The last formed knob always is more full and elastic, with a fresher colour and more vascularity. Those formed earlier become somewhat shrivelled, and present to the finger more the feeling of a solid, the surface being firmer and irregular. There is no pain for a long time, unless the place of the tumour subject it to the action of the muscles, or press it against the nerves, or impede the motion of a joint. In some of these cases, however, the pain of the tumour in the latter period was so great, that the suffering of amputation was considered as the lesser evil.

As the tumour enlarges, the cutaneous veins become more conspicuous, and on the convexity of the more elastic projections the smaller vessels are numerous. The colour of such projecting parts of the tumour is peculiar. There is a faint yellowish red, deepened by the ramifications of these cutaneous vessels.

On the prominence of some of the older tubercles the cuticle breaks; a pale fluid exudes from small holes. From the same source there in time springs up a spongy and luxuriant fungus. This fungus frequently bleeds; and it is this character which induced Mr. Hey to give the disease the name of fungus hæmatodes. By this time the disease is propagated to other parts of the system; to some of the viscera of the abdomen, and most commonly to the liver; and there are felt internal pains, which, although they may be relieved by bleeding and blisters, are fatal signs. For now we observe a rapid and singular termination of the disease in death. The constitutional powers are suddenly affected; the patient is seized with rigors, attended with sickness; the countenance suddenly changes; it becomes pale, and of dingy hue or earthy colour. Sometimes the skin assumes a very peculiar bright yellowish tinge. In the meantime there is a remarkable irritability of stomach, so that nothing will stay on it; the pulse becomes very feeble and rapid; the patient has internal pains; he becomes more and more feeble,

insensible, and dies. From the occurrence of these constitutional symptoms, the patient dies in the space of from three to eight days.

STRUCTURE OF THE SOFT CANCER.

Soft cancer may attack any of the structures of the body. We find it here arising in the bone after bruise or fracture. If it do not arise in the muscles, it very readily attaches to them, and is propagated through their substance, and it certainly arises in the soft substance of the limbs. It often commences in the lymphatic glands, as in the first case, in those of the groin. It attaches to them also in a secondary way, and yet not always in the course of the lymph. For example: the disease of the testicle will be succeeded by the affection of the popliteal glands, as in the seventh case. Of the internal parts, its most frequent seat is in the liver. It affects the lungs also. I have an example of this disease in the eye, and then it readily communicates to the brain. In the eighth case there is an example of this disease in the popliteal nerve; and hereafter we shall have examples of it in the mamma.

In its structure, this tumour has some slight resemblance to the carcinoma; but at the same time there is something which distinguishes it from that disease, and from all other diseased structures.

The soft cancer, which has burst into full maturity, exhibits two distinct portions. The central

portion (which probably retains the original character of the disease) consists of a very dense membranous texture, forming cells, which, on a section being made, exhibits the appearance of meshes, or rings *(ansa)*. Within this, and embraced by it, the second and more peculiar substance is contained. It is a soft and compressible matter, of a greyish colour.

The meshes of cellular texture are of all sizes. They are in smaller circles in the centre, and longer towards the circumference of the tumour. They are not like the common cellular texture, and are unlike the texture of true scirrhus and carcinoma. They have a particular density and transparency, and are in this respect like soft cartilage.

The greatest portion of the tumour in the examples which have sent forth an exuberant fungus, consists of a mass like concreted blood. This mass consists of the peculiar substance contained in the cells freed from the compression, and suddenly developed and expanded. In some specimens which I have injected, the vessels were seen in the soft membrane formed in this spongy mass, and the coloured size had exuded, and lay betwixt the fungous matter. But there is still another circumstance which gives obscurity to the structure of this tumour, that is, the accident of blood being extravasated into the interior of its structure. I shall reserve my statement on this subject until my reader has perused the following cases.

CASE I. OF SOFT CANCER.

Clayton's Ward, June 1, 1815.

Robert Clark, a gardener, aged 68. He has been brought to the hospital on account of a large tumour seated in the groin. He thinks it came from a sprain. He was employed lopping the branches from a tree, to the stem of which he clung firmly with his thighs, when he thought he sprained the right groin. The next day there was a swelling all down his thigh, with blackness of the surface. A tumour in the groin succeeded to this. It was hard and painful from the beginning. It was not a diffuse swelling, but circumscribed, hard, and painful.

On being questioned on the state of his constitution, he says, before this period he was subject to heats upon his skin, but was otherwise in health. In three months from the time, he was employed felling trees, the tumour has assumed its present condition.

The tumour occupies the place of the inguinal glands; it is of the size of a large melon. The Poupart ligament pinches it down, and we might persuade ourselves that it is still altogether external to the abdomen, but it is possible that it may have shot within the ligament. It embraces the crural artery and vein. Its colour is dark purple; its surface is irregular, and it gives unequal resistance to the finger, for the more prominent parts have an

elasticity, which conveys the impression of the contents being woolly, but having more springiness and elasticity than corresponds with that word. The man complains rather of tension and numbness of the thigh, than of actual pain in the tumour. This is no doubt owing to the tense state of the fascia, and the pressure on the anterior crural nerves. He is ordered mild laxatives, and a cold lotion is on the tumour.

June 6*th*. This is undoubtedly the disease called soft cancer, or fungus hæmatodes. It is at all events of so threatening a nature, as to make it desirable to have it extirpated. But that is quite impossible—already the tumour has increased in size; even since the patient was brought into the house: the colour is much darker, and there is now a tingling pain in the tumour itself.

10*th*. The pain increases; the pulse continues regular; the tongue is white, and he has passed a restless night, with griping pain in the abdomen.

13*th*. He has been relieved by anodynes; he is taking the ol. ricini with laudanum.

17*th*. The tumour is increasing; the discolouration extends to the outside of the thigh. There is œdema of the leg.

21*st*. The countenance indicates constitutional disorder; the bowels are costive; the tumour is larger, and more diffused; it may be felt within the Poupart ligament. There is great increase of pain.

28*th*. The pain has been assuaged by the ap-

plication of leeches, and the cold lotion. The countenance is dejected; the colour unnatural; the pulse intermits.

July 1*st.* Although the pain and the increase of the tumour have been occasionally checked by the application of leeches, it blackens. The countenance is cadaverous, and of a yellow hue. The pulse is weak, and intermits every third beat.

8*th.* The tumour increases; the strength declines; there is severe pain in the tumour; the skin has cracked, and there has been an oozing of blood; the speech faulters; the breathing is anxious—he is dying.

Dissection.

The tumour proves to be of that pulpy soft nature which is now called fungus hæmatodes. It consists of a greyish mass, streaked with blood, presenting that confused appearance of parts, which makes it difficult to say what belongs to the living structure, what is secretion, or contained. The tumour involved the vessels and nerves of the thigh, and extended under Poupart's ligament and upwards to the right kidney. All the lumbar glands partook of the disease, and it had affected the abdominal glands very generally.

The coats of the crural artery were soft, and had, in some degree, partaken of the disease where they were involved in the tumour. The inner coat was unusually florid, and separated with much ease from the others.

CASE II. OF SOFT CANCER.

Wm. Phineas, ætatis 45.—*Clayton's Ward.*—This man is of a middle stature, muscular, but not fat; his visage is particularly thin, and it has a foul yellowish colour; he has dark eyes, and black hair.

About nine months ago, he broke his thigh-bone. The bone was knit together, he fell, and broke it a second time, at the same place. After the usual period of confinement, the bone being united, a tumour rose gradually in the very centre of the thigh. It was attended with great pain. It has uniformly and imperceptibly increased until now that it forms a tumour, measuring three times the circle of the natural thigh. It occupies the middle of the thigh, and surrounds the femur, and projects nearly in an equal degree on all sides.

There are here some peculiar circumstances, and a distressing alternative is offered to us. The tumour has all the character of the fungus hæmatodes, or soft cancer. To the feeling it conveys the notion of a soft spongy mass, distending the fascia of the thigh. It is evidently under the muscles, and the vasti rectus and sartorius muscles bind it so as to give it a peculiarly irregular surface. The pain is very great—an incessant dull pain. While he describes his pain as a dull sensation, and in this expression distinguishes it from the occasional sharp and shooting pain of some tumours, yet his suffering must be great in degree,

since he expresses a desire to lose the limb. He is a steady man, and although not obtrusive nor loud in his complainings, he expressly wishes to lose his limb, although he sees that in order to do this, it must be cut off close to his body. The skin has already assumed that light jaundiced colour, which on former occasions I have found to mark that the constitution is tainted with the disease.

On the other hand, here is a tumour arising distinctly from an accident, and there is a possibility that the tumour so arising may not be that formidable disease which we apprehend. In the meantime, the growth of the tumour is so rapid, that an operation will soon be quite impossible. If it should prove to be a tumour of the bone, possessing no malignant character, of which we see examples, amputation will save his life. Even if the disease be of the nature of soft cancer, the operation affords him a chance of life. No condition can be an aggravation of his present state.

A consultation having determined upon the operation, it was performed in the following manner.

Operation.

The sketch, Plate IX., shews how high the tumour reached upon the thigh, and how impossible it would have been to have performed amputation in the usual manner*. The tourniquet was

* This is as reported by my dresser.

applied, but it was not found effectual, and it was necessary to press with the thumb upon the artery at the groin.

The large amputating knife was laid upon the inside of the thigh, above the tumour, and a semicircular incision made down to the bone, but inclining a little upwards, and forming a flap of the sartorius and triceps muscles. Here the surgeon giving the knife to an assistant, secured the femoral artery and the profunda. Taking the knife again, he made a semicircular incision, commencing at the extremity of the first, on the fore part, and meeting it behind. This incision was through the integuments only: the muscles were cut through individually; when cut, they retracted, and exposed the smooth surface of the tumour over which they had been stretched. Instead of dissecting further, he sawed through the bone, and then the assistant pulling upon the leg, he separated the whole tumour from its remaining adhesions, with very little aid of the knife. The saw went through the lesser trochanter; a great many arteries required to be taken up, but with this exception, the operation was more quickly performed than a common amputation.

The flap formed by the muscles of the inside of the thigh was brought up upon the face of the stump, and the semicircular edge of the first incision corresponded with the edge of the integuments on the outer semicircle of the stump.

On the day following the operation, he had a

slight disturbance of constitution. He says, that his sufferings during the operation were nothing to the agony of the disease. The lower part of the dressings were wet with oozing. On the second day he had some starting of the stump, for which he took an anodyne; the dressings were dry. On the fifth day two of the straps were renewed on the face of the stump. The integuments had a due degree of fulness, and blush. They adhered at the upper part of the stump; a little watery discharge, with flakes, came from below.

On the 6th day. The stump dressed; an unfavourable suppuration declared itself, deep betwixt the flaps. On the 7th there occurred a trifling oozing, which ceased on undoing the dressings. This was probably from some of the adhesions being torn. Two ligatures were brought away. On the 8th there is the following.—The discharge is in great quantity, although much of the face of the stump is adhering, and looks healthy. This is suspicious; let the tourniquet be replaced. On the 9th. There was a little bleeding last night, which ceased on the house surgeon opening the stump. At the dressing to-day there is no clot in the face of the stump; but thin matter, tinged with blood, comes from the deep cavity. The discharge amounts to some ounces.

On the 10th day an alarming hæmorrhage took place. The stump was exposed, and the vessel sought for in vain. The new adhesions were torn up, and the coagula washed away. The ligature

was secure upon the main artery. The blood came from a confused mass, which baffled all endeavours. At this time I came into the hospital, and took up the femoral artery, by cutting on the groin. The oozing continuing, I enlarged the wound a little, and tied the profunda, which stopped the bleeding. But the patient was fast sinking.

Examination of the amputated Limb.

When the muscles were dissected off, the tumour was found to surround that part of the bone which had been fractured. It consisted of a cartilaginous substance, which, when cut through the middle, exhibited a well or cavity, containing blood. The rest of the tumour was a soft pulpy-greyish mass, too delicate in its texture to be preserved in spirits. A section was made of the bone and the tumour; and when the parts were some days macerated, it was found that the bone was extensively diseased, and a peculiar semi-transparent matter, of a grey colour, filled all the cells of the bone; and now it appeared that the bone had been first diseased at the fractured part, and that from thence the disease had propagated itself in all directions.

Examination of the Stump and Body.

On opening the face of the stump, both the femoral artery and the profunda were found secure by ligatures: a firm clot was found in the femoral

artery, and the cause of hæmorrhage was nothing in common with what is called secondary hæmorrhage. On tracing one of the branches of the profunda, it was found to open, and as it were expand into a cavity containing blood. The substance surrounding this cavity was of a nature similar to the great mass of the tumour. There is little doubt that a small part of the tumour had been left, or that the muscles, tainted by the contact, had propagated the diseased action. The diseased portion increasing with that rapidity which characterizes this sort of tumour, had destroyed the coats of the vessel, and from this sprung the hæmorrhage which proved fatal. Had the tumour been entire, the blood would only have run into the interstices of its texture; but being open and upon the face of the stump, the blood had free egress. The cavity on the stump was in all respects similar to that found in the centre of the tumour.

On dissecting out the head of the femur, and sawing it through, and macerating it, the disease was seen to have propagated itself to the head of the bone, and through the whole cancelli.

Remarks.

When there is a formidable bleeding from the deep part of a stump, it is best to take up the trunk of the artery on the fore-part, for digging in the face of the stump will not be effectual. The artery will not be found, or if found, it will

burst out again, even if the ligature should be applied. This is the rule when there is sloughing of the stump. Here it was equally necessary, for the bleeding artery was in the midst of a diseased mass.

When this operation was performed, it was part of the plan to hold a consultation on the state of the bone, when sawed across; and it was resolved that if the disease seemed to have propagated itself to the head of the bone, that it should be extracted, which would have been in effect an amputation at the hip joint. When the bone was examined, being bloody, and recently sawn across, no disease could be discovered in it; but it was very apparent after maceration. (See Plate VIII. Fig. 2.)

Had the bone been extracted from the socket, still the same consequence would have resulted, since it was not the bone, but the soft parts which propagated the disease. The bleeding was from the circumflex artery, as it passes near the trochanter minor, and this part of the muscle could not have been cut away.

THIRD CASE OF SOFT CANCER.

Seymour's Ward.

Ann Moffat, aged 28. A large tumour occupies the middle of the thigh of this young woman. She gives the following account of its progressive increase. About five months ago, she had pain in the middle of her right thigh: she describes the pain as in the flesh of her thigh, not deep, nor in the

bone; she could not account for it. When warm in bed, the pain was greatest, and then it shot into her leg; it was not such as to prevent her walking.

About two months after her first attack, the pain increased in violence, and a swelling appeared in the middle of her thigh, so that she was induced to seek relief in this hospital, and for a fortnight she was under the physician. By the application of leeches and blisters, the pain was relieved, and the swelling very considerably abated. She went into the country, and about a fortnight after leaving the hospital, the pain recommenced, and the swelling rapidly increased. Again she applied a blister, in hopes of experiencing the same relief as formerly; but on the contrary, the swelling increased more and more from that time, until now, that it measures twenty-one inches in circumference.

It is the alarming size of the tumour which has brought her into the hospital a second time; still she is not lame, but only inconvenienced by its size. She can bear the tumour to be freely examined: indeed she now says she never had much pain in it; but about three weeks ago she was seized with pains behind the knee joint, which have continued ever since. There is a swelling in the cavity of the ham, which makes me believe that this pain proceeds from the disease affecting one of the lymphatic glands.

The great tumour is somewhat irregular, and has on its surface many enlarged veins. It is tense, and conveys the sensation of a soft body impacted under a strong covering. It does not convey the same sensation with scirrhus; for though irregular upon its surface, it wants the knobbiness of a glandular tumour: it is more doughy, and is very slightly elastic.

The catamenia have been absent these seven months; there is tumour of the belly, and she confesses herself pregnant.

Consultation.

1. By her own confession, and the report of Dr. Merriman, this young woman is seven or eight months gone with child: we have, therefore, in this question to consider the safety both of the mother and the child.

2. This is one of those formidable tumours commonly called *Fungus Hæmatodes*. Now experience tells us that before the expiration of the natural period of gestation, the tumour will have enlarged so much, and extended so high, that amputation will be impossible.

3. If amputation be now performed, there is great fear that premature labour may be the consequence. The child would be lost, and it is probable the mother also.

4. With examples fresh in our memory, it is impossible to promise success from amputation; for the

disease may have gone deeper or higher than it appears to have done. The glands of the groin, though apparently natural, may be diseased; or the parts in the groin, as within the ligament, may be already tainted; or, which is most probable, already the constitution may have partaken of the diseased action, and then there is no longer safety in amputation.

5. Assuming that amputation in such a case of tumour, affords the greatest chance of safety to the patient; yet the new feature of the case, the pregnancy, forms a decided objection.

6. It was next put to the consultants, whether or not it would be proper to procure premature labour, in order to shorten the time in which amputation would prove dangerous, and at the same time preserve the child. It was decided against the proposal, first, on the general view of the case, and secondly, on this particular exception: viz. although the patient stated herself to be seven months gone with child, yet it did not appear to Dr. Merriman that she was so far gone, and that therefore, in the procuring delivery, the child would be lost.

It was on these grounds decided that no operation should be performed.

Leeches to be applied on the surface of the tumour. The foot, leg, thigh, and tumour, to be firmly rolled with calico; and the tumour kept wet with the aqua ammoniæ acetatæ.

Dec. 28.—Pressure, leeches, and the cold lotion,

so far from diminishing or even arresting the progress of the tumour, have given much pain in the tumour itself, whereas hitherto the pain has been behind the knee.

30*th*. This unfortunate young woman is resolved on leaving the hospital; she proposes returning after the delivery of her child. The tumour has evidently increased, and the veins have enlarged during the short time she has been in the hospital.

Some time after this, being taken in labour, she was carried to the Mary-le-bone workhouse; she afterwards submitted to amputation, and died.

FOURTH CASE OF SOFT CANCER.

About this time a case was communicated to me by Dr. Dickson, Physician of the Fleet, from which I shall make some extracts.

Robert Lane, *Marine*, H. M. S. Pomone.—Of a scrofulous habit, and addicted to drinking, had his left leg jammed in the main hatchway. He does not seem to have been much hurt, or to have felt it much at that time, for he continued to do his duty as usual for a fortnight. But he then began to have pain, and it was increased so much by exercise, and while on duty, that it was necessary to place him on the sick list. For a month the pain and swelling continued to increase, and the integuments on the head of the fibula became

inflamed, the swelling was tense and shining; it was not painful when examined, but motion of the limb gave pain.

It was on the 5th of May that he hurt the leg: on the 25th of July he was received into the Naval hospital; in the end of September the tumour measured 23 inches in circumference. It occupied the upper part of the leg; it was unequally elastic; it had many conspicuous veins on the surface, and was of a reddish blue colour.

On the 28th of September they punctured the tumour, for they thought they felt fluctuation—a stream of pure venous blood flowed; a pint was lost, and it required the compress and bandage to restrain it. Three days after, when the dressings were removed, a tenacious fluid, like size, issued from the puncture in so great quantity as to drain through eight folds of blanket, a mattrass, and the sacking of the cradle to the floor.—On the 2d of October, it is stated that the tumour presented a livid appearance, and was much enlarged, and a substance protruded from the wound. A probe could at this time be passed in all directions through the substance of the tumour. It gave no pain, and produced no bleeding. On the fifth of the same month the swelling extended above the knee, and inflamed lymphatics could be traced up the thigh.—From this time both the tumour and the fungous growth rapidly increased, attended with profuse nocturnal sweating, the pulse was small and quick, and the face flushed.

It was now considered necessary to amputate the limb.

Appearance of the Limb on Dissection.

On dissecting off the integument, the fascia of the leg was remarkably tense, and several of its fibres were thickened, being as round as the tendons of a small muscle. The tumour presented a mass of disease like brain in consistence and colour, all the natural texture was destroyed, and the substance presented a variegated nutmeg appearance described by Mr. Hey and others, but no sac could be discovered. The disease apparently originated from the fibula, which was found in a complete state of caries from the head to nearly two thirds of its length; it had asperities, being at the same time rough and eroded. The tibia was also diseased. The arteries were entire, but were ossified in several places, and some masses of ossification were found detached in the tumour near the arteries.—The muscles of the thigh appeared for some way up like raw fish; and where they appeared healthy in texture, they were unusually pale.

To continue the statement of the case, which is most minutely made in form of a journal.—The patient did well to the 5th day, and on the first dressing, the integuments were found to have adhered in part, and the surface was moistened with good pus. On the 6th day they were surprised

with a hæmorrhage, and on removing the dressings, the adhesions were found to have given way. On the 7th there was a profuse discharge of thin matter from the stump; it was entirely opened, with pain, and now a tumour appears in the middle of the stump; in the afternoon another and a more alarming hæmorrhage took place. On removing the dressings, the face of the stump was found covered with dark coagulum, and the hæmorrhage having opened the stump still more, the tumour was seen to come from the bone. On the 8th, in applying the straps, a gush of blood issued between them; it came from the bottom of the lower angle. It did not come per saltum, nor in a stream, and no artery could be found. The pulse became quick and small, and hurried; the countenance altered for the worse, and the night sweats returned. On the 10th another hæmorrhage occurred: it was stopped by the application of sponge, and the reapplication of the dressings. The tumour in the meantime lost its smoothness and its shining appearance, and the discharge was fœtid. On the 11th day symptoms of tetanus appeared. He could not open his mouth fully; he swallowed with difficulty; the masseter and temporal muscles felt rigid; the countenance became more sunk, and the eyes dull. As the evening advanced, he became comatose, and the breathing more and more difficult, and he died.

On examining the stump the periosteum had separated from the bone, and the tumour was seen

to arise from the medulla of the bone. It had shrunk considerably during the last days of his life, and it now cut like the cortical part of the brain, enveloped in a thick membrane. See the Preparation in my Collection.

FIFTH CASE OF SOFT CANCER.

French Ward.—James Lewsley, aged 17.—I observed this young man in the waiting room as an out-patient. He said his friends alarmed him by saying he was going to have a white swelling in his knee. I found a disease not in his knee, but in the head of the tibia, a tumour, which, to the eye, appeared like a swelling over the bone; but which, on examining it more particularly, was obviously attended with an enlargement of the bone. Three months before this he had experienced a slight pain on the inside of the knee, and head of the tibia, and it has continued till the present.

From the moment I saw this patient, I felt anxiety for him, and pointed out to the pupils that this was a tumour forming within the bone, and not a scrofulous enlargement, and desired that they should watch it; as in all probability it would prove another example of the fungus hæmatodes.

For some weeks this patient was treated as for inflammation of a bone, by repeated application of leeches and blisters, on alternate sides of the head of the bones: for presently it appeared that the heads of both the tibia and fibula were affected.

By this means the general swelling was diminished, but on the outside, immediately below the patella, there remained a tense elastic swelling, resembling, in some degree, an enlarged bursa. Leeches were again applied, and an issue made by caustic. But these means, added to opiate and sudorifics, had no effect in arresting the progress of the tumour, for the swelling had assumed a form which authorized that name. The opening, by the principal caustic, became an ulcer; that is to say, it showed a peculiar character, and began to widen. And observing that the leg had become œdematous, and that the tumour of the bones enlarged, and the ulcer had obviously a connexion with the disease of the bone, I took the lad into the house 22d August.

25th August.—The ulcer has changed its appearance in a remarkable manner, and very suddenly; it has opened its margin, and a foul fungous mass occupies the centre. On pressing the sloughy surface, there is still the feeling, as if a spongy and elastic substance were under it. It appears as if a large slough were about to be thrown out; but it is not a slough, it is an organized excrescence; it bleeds, and discharges a dark coloured sanies.

27th. He feels the part hot, but has no pain, unless in pressing the tibia; a watery ichorous discharge flows from it. Mr. B., previous to consultation, introduced his little finger, without resistance, quite into the head of the tibia. The fungus

bled, but only in such a degree as to show that it was vascular. It did not amount to hæmorrhage. It is dressed with slips of lint dipped in the camphorated liniment, and covered with a poultice.

31*st.* The tumour has increased in an extraordinary degree; it is larger than the fist, and quite open and full blown, like a flower. In its substance it is spongy and soft, and easily broken down; in colour it is cineritious, like slough, and bloody. It bleeds on being roughly treated, but has no sensibility. The young man's health begins to break. He had been informed of the change which would take place, and now that it has come, he stands prepared for the worst, and has consented to lose the limb. A cold lotion has been constantly on the limb, yet the tumour has increased with remarkable rapidity; it is of the size of both fists, and embraces the heads of the tibia and fibula. The leg is œdematous, and the integuments inflamed.

September 8th.—The stump has been dressed twice since the operation, and looks well; he is easy and comfortable in his feelings.

19*th.* Complained of pain in his side this morning; it went off towards the afternoon.

20*th.* He has had a restless night; his pulse is quick, 100, and his tongue white; he was attacked with a rigour, which has been succeeded with heat. He is very sick, cannot retain any thing on his stomach, and his countenance is sunk.

Observation at evening Lecture.—You have seen that I examined this patient very particularly to-day, and indeed his situation is very interesting; you have seen that the stump looks well, the ligatures long since removed, and the wound contracted. There does not seem, therefore, any source of irritation in the stump. Whence then arises his present condition? he daily wastes away, and is now very thin; he has shiverings followed with flushes; his tongue is white, and he is covered with perspiration, and there is a slight yellow tinge on his skin. Such an attack will sometimes precede the opening and disorder of a stump about the 9th day after the operation: or the patients in hospitals will be affected by the crowded state of the house. I wish I could so consider the present attack, but I fear it is from another cause, from the irritation of internal disease.

Journal resumed.—Last night he had another attack, shivering succeeded by heat and vomiting. He was somewhat relieved by his mixture, and he had a refreshing sleep.

21*st*. To-day he is very unwell; he has had a repetition of the same attack. He complains of pains in his right side, with a heaviness about the region of the stomach. He has been relieved by the opiate in an effervescing mixture; the tongue is still white; a blister is applied to his side.

22*d*. No shiverings this morning, but he is worse. He complains of much pain in the seat of the liver, the tunica conjunctiva is deeply tinged

with bile. He continued getting worse till the 24th, wasting from hour to hour, complaining of pain in his right hypochondrium; his skin became deeply jaundiced, and he died on the 24th.

Dissection.

The amputated limb is preserved. On injecting it from the femoral artery, the fluid burst out from all the surface of the tumour. The tumour arose from the centre of the tibia; it consisted of a soft medullary substance. The cancelli of the bone exhibited the same appearance as in the second case, and which is engraved on Plate VIII. Fig. 2.

The right side of the liver was much enlarged, and the surface was like variegated marble. There were spots of a bright yellow colour, from the size of a pin's head to that of the point of the finger. These spots were in clusters, and such parts of the liver felt soft, and around these spots there was a vascular structure, deeply stained with blood.—Similar spots of disease were seen on the lungs, and some of these were of a vascular soft texture, having the peculiar substance of the soft cancer intervening.

CASE VI. OF SOFT CANCER.

——— ———.—*Clayton's Ward.*—This young man was a sailor, and three months before the appearance of the tumour of the leg, he received a blow on the upper part of the shin by the recoil of

a gun. He does not attribute the growth of the tumour to this hurt, and it was only by questioning him as to all probable causes, that this circumstance was brought to his recollection. The tumour extends from the middle of the tibia to the tendinous insertion of the patella into that bone. It surrounds the tibia and the head of the fibula, and evidently goes round to the back of the bones, for it has distended the gastrocnemius and the soleus muscles. Its surface is distinguished by seven or eight distinct knobs or tubercles, which are soft or yielding, and give no indication of solidity, or of scirrhous hardness. The tubercles on the lower part of the tumour have more firmness and solidity than those above. The surface is of a dark reddish colour; the centre of the tubercles being of a yellowish colour, but crossed with numerous small veins, which give a venous or purplish tinge. The tumour has been two months of acquiring its present magnitude, and is not accompanied with pain.

When this young man had been a few days in the hospital, and when I had ascertained the disease to be that most mortal of tumours, the fungous tumour, called soft cancer, I informed him of his danger; he was surprised that I should consider it so seriously, but threw himself entirely into my hands. In these circumstances, such confidence only adds to the oppressive feelings which the anticipation gives rise to. At this time he had neither pain nor lameness.

Consultation.

Notwithstanding the frequent application of leeches and blisters to the base of the tumour, and rolling the limb, and keeping the roller wet, the disease has made progress. There is now pain in the tumour, a new lobe or convexity has formed, presenting the appearance of a suppuration pointing. Two spots on the old knobs have ulcerated, and discharged a limpid fluid. The glands of the groin have enlarged very considerably, and they are tender. Do these circumstances warrant amputation, and what is the chance of saving the life? My colleagues look less despairingly on this case than I confess I do. It may be possible that the glands of the groin are inflamed only in consequence of the leech-bites and the blisters; but, independent of this circumstance, I fear we shall see the disease take an unfavourable turn at the end of three months from its commencement. Amputation is determined upon, as affording the only hope of saving the life.

4th day after Amputation.—The glands of the thigh and groin have subsided in a very remarkable manner. During the operation, the muscles of the thigh were unusually pale. On the first dressing, the surface was pale, although there was partial adhesion. On the second dressing, the stump looked well, and the patient's health and spirits were observed to be very good. But about the ninth day the stump looked ill; there came

a profuse gleety discharge, and the granulations were pale.

March 10*th*. The report is, " He looks ill, and has had rigors; here is the commencement of mischief.

12*th*. For some days he has been looking ill, and falling low; he vomits every thing he swallows. He has got some relief by the effervescing mixture with laudanum. His pulse is scarcely to be distinguished.

14*th*. " The stump is much changed; it is dry, for there is very little secretion; the soft parts have retracted, so as to expose the bone. His countenance has a dirty, or dull grey colour. He is low and sick, and complains of a pain in his right side.

15*th*. " He is sinking exactly as the former patient did. It is very melancholy to see a young man, having no idea of a mortal disease, thus quickly cut off; and shocking to find this formidable disease so frequent, without affording any useful indication to guide our future practice.

" He died in the evening."

Dissection.

We found the liver in a very extraordinary state. It was enlarged, and almost black, that is, it had the colour of a large clot of venous blood—it was indeed very much gorged with blood. Within it were those soft tumours, indicating too evidently that either the external disease had been propagated, and fallen on this viscus, or that there had

originally prevailed a more general disorder.—See the Specimen in the Collection.

The amputated limb was injected, and it is preserved in the Museum. The veins injected from the saphena exhibited an extraordinary and rich net-work, running on the face of the tumour. The tumour is split, and forcibly torn asunder, so as to shew the tibia within it. The periosteum has separated from the bone, and remains attached to the tumour. The surface of the bone is left rough, and indented by the pressure of the tumour. The structure of this tumour is the same with those we have seen, only that it retains a great deal more of the cartilaginous firmness.

SEVENTH CASE—SOFT CANCER OF THE TESTICLE.

George Tanby, aged 23.—*Clayton's Ward*, *Aug.* 1.—The left testicle is swelled, and hard. The integuments are inflamed, and of a dark purplish colour, resembling a scrofulous inflammation. There is an ulcer on the anterior and most prominent part of the scrotum. He attributes this to cold, and says, that after labouring in the field, and being very warm, he laid himself down on some damp straw in the barn, from which he thinks he caught cold, for after this he had shivering, and vomited. It was some time after this, and just thirteen weeks ago, that he felt a sudden pain, as of something shooting into the testicle, and the same pain has continued ever since, with short in-

tervals of ease. In the beginning he had no pain of the loins, but a fortnight ago he was attacked with pain there; it does not continue.

Sept. 10*th.* A foul slough has formed in the ulcer: it appears to be of the body of the testicle. Hitherto the disease has been treated as a scrofulous testicle; the patient being a young man, with jet black hair and a fine ruddy complexion, apparently in health and strength.

18*th.* Some time ago a foulness appeared in the sore, as if a sloughing were going to take place from the body of the testicle; but within these few days it has totally changed its character. Soon after this change took place, the ulcer enlarged, the slough appeared like a clot of blood, and the whole body of the tumour began to swell considerably. There was a succession of bloody sloughs removed from the cup of the ulcer. At present what appeared like a slough has assumed the character of concreted blood: but when an attempt is made to bring the clot away, it appears to have an organized structure, being thready or fibrous, and possessing a degreee of toughness which requires the scissors to cut it through. Of late, blood has oozed from beneath the protruded body.

20*th.* Within these two days the same kind of ulcer has formed on another part of the scrotum; a fungus begins to project from this also. Since the projection of the fungous tumours from the ulcer, he has become very much weaker, so that he has required nourishing diet and wine.

21*st*. He complains of great pain in the testicle; of pain also in the left side of his neck and body. The countenance is materially altered; it is pale, with a cast of leaden colour, and in this is indicated the character of the disease. At first the face was fair and ruddy, then it became flushed, and now it is pale and sunk, with a very peculiar tinge. The pulse has been quick and feeble, 120 in the minute. He has great thirst; the tongue is brown and furred.

Since yesterday the left knee has become very much swelled, and so painful that he cannot bear the slightest pressure or examination. The veins of the thigh and knee are enlarged and tense, and there is great heat and twitching of the knee.

22*d*. He died this morning.

Dissection.

The body of the testicle exhibited the peculiar structure of the soft cancer, or fungus hæmatodes. It consisted of a confused greyish bloody mass, confounding all natural texture, and very difficult to be described. The cord was not affected, nor were the glands of the groin diseased. But what is more remarkable, the popliteal glands had suffered by the same disease which destroyed the testicle; and these diseased glands of the ham were the source of that excess of pain felt during the three last days of his life.

Remarks on the preceding Case.

The following remarks were made in the evening lecture of that day:—You should look upon every case as under your own management, and consider yourselves as responsible. If you have done so in this case, I shall stand excused for not having amputated at an earlier period. Hereafter we may learn to recognise this dangerous disease, before the glands have become affected, or the constitutional symptoms are declared. In the present instance there was an utter impossibility of cutting off the disease from the time that it unequivocally showed itself. In the beginning, I thought that we had a scrofulous testicle; and if you look now to the case of Angus M'Intire, you will still recognise the resemblance*. There you see a sloughy fungus projecting from the fore part of the body of the testicle. The edges of the scrotum are inflamed and dark coloured; the whole appearance, and particularly the slough has much resemblance to the excrescence in the case of Tanby. When you next look to this, however, you may observe that it is of a dirty yellow colour, and in consistence like wet chamois leather. This dead part will separate, and exhibit pale granulations, and thus declare its harmless nature. Such, I had hoped, would have been the change on Tanby's disease: but instead of this, we have seen

* See this case, under the head of Scrofulous Diseases of the Testicle excited by mercury, in a future number.

the true character of fungus suddenly declared, the constitutional disorder excited, and the glands of the ham diseased, as soon as the nature of the complaint was distinctly marked in the original tumour of the testicle.

EIGHTH CASE.—SOFT CANCER IN THE CENTRE OF THE POPLITEAL NERVE.

About three years before I saw the subject of the following case, he had fallen from the side of a ship. It happened in this way: seeing his fellow workmen falling, he threw himself forward to break his fall, and succeeded; but in doing this, he fell himself; for he was caught by the ham, on a projecting bolt in the side of the ship over which he turned, and hung suspended. He suffered much from the bruise on the back of the thigh, but in a short time got entirely well.

Some time after this, he begun to be much troubled with a pain in his foot. This pain was in a part not likely to procure him much sympathy; and he suffered much and long without attempting to procure assistance, or only such as the extremity of pain will induce a man to try.

But the pain continued to increase from day to day, until it totally unfitted him for labour, exhausting and wasting his frame by continued watching. This pain was of a peculiar kind; it was confined to the bottom of the foot, and was like an intense burning, while there was not the slightest discolouration or swelling in the place.

Often he would rise at night from his bed, and stand on the cold stones, or plunge his foot into warm water or cold water, or alternately.

He now sought relief in a public hospital, and the attendants disconcerted with the strangeness of the symptom, which they did not comprehend, put him, as is usual on such occasions, on a course of mercury; but this trial of a medicine did no good, and he went home. But still suffering continually, he was induced, after a lapse of some months, to return to the hospital, and was again put on a more severe and a longer continued course of mercury than at first. By the time this was over, he had suffered continually for two years, and was reduced to a skeleton, and was far gone in hectic.

When I saw him he gave me this account, and then continued to complain of the extreme pain in the sole of the foot. He told me too, that he had a strange numbness of the leg when he sat down. On examining into this circumstance, which I thought would lead to some explanation of the more prominent symptom, I found a tumour in the ham, which, when pressed, gave no particular pain, but rather a sense of prickling numbness down the leg. The tumour was to the feeling, of a bony hardness. I conjectured that there was some tumour pressing and wedging upon the popliteal nerve; and that this injury to the nerve in its course was referable by the patient's feelings to the extremity and final distribution of the nerve.

I thought of an operation, yet I was deterred from it by the dying state of the poor man, who now suffered but indirectly from the disease of the leg, and in all probability death was no longer to be avoided by the removal of the original cause. I thought that he might be brought round so as to gain some strength; but within the week he died.

Dissection.

The examination of the cavities was not permitted. On dissecting the limb, I found a tumour under the fascia, and about three inches higher than the usual place of the popliteal aneurism. I found some nerves running over it of a remarkably pure whiteness. On tracing the sacroisciatic nerve, I found it enter into the substance of the tumour; but on more careful observation, I observed that the peroneal or fibular nerve, though close on the tumour, was not incorporated with it; but that the tibial nerve was incorporated with the tumour. On making a section of the tumour, it had much the appearance of a large ganglion on the tibial nerve: the fasciculi of the nerve could be traced only a little into its substance; and in the interstices of the fasciculated bands a vascular fatty substance could be observed, which resembled marrow. By more experience, I now recognise in this matter the distinguishing character of the cancerous tumour we are now considering.

I think it is impossible to mistake the nature of the symptoms. I have no doubt that the injury received on the ham was the cause of the disease in the nerve, as in other cases we have seen a blow produce the disease in the bone: yet I think we cannot close our eyes to the striking proof of the affection of a nerve in its course being referable to its extremity. Had the nature of this disease been understood earlier, I have little doubt that cutting across the portion of the popliteal nerve, which forms the tibial nerve, and the extirpation of the tumour, would have been succeeded by perfect relief from pain, at the expence of losing the use of the leg.

Observations on the Fungus Hæmatodes, or soft Cancer, continued.—Of the Hæmorrhage which proceeds from such Tumours.

In the latter stage of this tumour we have seen the skin crack, and a bloody serum exude: and when the life of the patient was prolonged, a loose, spongy, and bleeding fungus spring up rapidly. This sudden growth is of so delicate a texture, that it bleeds from time to time. It suffers the probe to be pushed through it without producing pain; and when thus rudely treated, it bleeds, but not profusely. These tumours, however, are the occasion of a more formidable hæmorrhage, and from a different cause.

It will be observed, that this tumour has no capsule, but changes every thing it touches to its

own nature; and this it does without any process of thickening or condensation of the cellular texture, such as accompanies the common process of inflammation. The tumour makes its progress by reducing every structure it meets, destroying the solid bone, as well as passing quite through the coats of arteries and veins. In a patient who died of this disease, I found a large tumour surrounding the vena cava, and on opening the vein, I found a portion of the fungus had destroyed the coats of the vessel, and pushed into its cavity.

The same destruction of the coats of arteries of the larger size makes great confusion, for then the tumour does not grow slowly, and with the character exhibited in the foregoing cases; the arterial impulse drives the blood through the weakened coats into the heart of the tumour, and from that through the substance of the limb. After puzzling the heads of the consultants, and defeating their ingenuity, the question is decided by amputation. When on dissecting the limb, the probe passes from the artery into the centre of the tumour, it seems to sanction the opinion of those who had declared the tumour an aneurism! Pott, in speaking of this tumour in the leg, describes it as, under the gastrocnemius and soleus, sometimes painful, sometimes small, and enlarging gradually, softening as it enlarges. When it has got to a large size, it seems to contain a fluid: if an opening be made for the discharge of the fluid, it is through *a strangely distempered mass:* it either derives its

origin from a bursten artery, or at least is always accompanied by it. This is a complaint, he adds, affecting the leg, removable, as far as my experience goes, by amputation only. A commentator adds, "A certain cure God wot, and perfectly chirurgical." Now this commentator is himself entirely deceived, in considering the tumour described by Pott to be a false aneurism; and I have witnessed the same mistake in practice; for in my youth I have been made to inject and dissect tumours of dilated veins, and which have been full of extravasated blood, *as aneurisms*, which, by the peculiar intermediate matter, I knew to be of the class of soft cancer.

Indeed, when we look into collections of cases, and see the confounding of true and false aneurism, fungus hæmatodes, aneurism by anastomosis, and varicose tumour, we cannot wonder that there should be some puzzling cases now and then presenting in practice.

When this tumour, called soft cancer, or fungus hæmatodes, comes in contact with great veins, it destroys their coats, and then the blood of the vein is let into the interstices of the tumour, so that it obscures what we may call its natural texture, and presents a very peculiar appearance. On a section being made of the tumour, it is seen to be half made up of coagulated blood. This has given rise to an opinion that the tumour is formed of extravasated fluid, which afterwards becomes organized*.

* Hey's Surgery, p. 255.

It is this circumstance which has also given rise to the opinion that the *anomalous tumour* proceeds from a bursten vein.

We find a very perfect description of this soft cancer, or fungus hæmatodes, given by Mr. Else, as occasioned by the rupture of veins. In speaking of the tumour of the arm which had destroyed his patient, and which he thought to be an aneurism, he says, he found, that instead of the artery, the vein had opened into the tumour: for, on opening the axillary vein, and passing his probe into it, he found a communication established betwixt the vein and the centre of the tumour. In the second and third cases he is still labouring to inform his cotemporaries that these are not aneurismal tumours, but merely the consequence of ruptured veins; and he thinks that he proves this by the fact, that the mass is chiefly made up of coagulated blood, and that the probe or injection passes from the vein into the centre of the tumour. He thinks he makes the demonstrations complete, that all the mischief of these tumours proceeds from the escape of blood.

It is this very circumstance, of these tumours pushing quite through the coats of veins, that has led some surgeons to suppose the tumours called anomalous, to be of the nature of the aneurism by anastomosis, so well described by Mr. John Bell. But no two diseases can be more distinct, as I have lately had an opportunity of demonstrating to our pupils, in two examples of the aneurism by

anastomosis, extirpated one from the forehead of a child, and the other from the lip. In this tumour, there appears on dissection, only a cellular spongy mass, without any intermediate secretion of matter foreign to the structure of the body.

In the second case of this series, we see that the soft cancer will open arteries as well as veins. In the first case, the coats of the crural artery were in progress of being dissolved; and in the second case we have seen that in the progress of the portion of the tumour left in the stump, a branch of the profunda was opened, and a fatal hæmorrhage followed; because the tumour not being under the support of fascia and integuments, but seated in the open and exposed surface of the stump, there was a free exit to the blood, which in other circumstances would only have been extravasated into the tumour, and would have exhibited the common appearance of a greyish mass, intersected with coagula of blood.

After perusing these cases, five of them occurring in my department of the hospital in the course of two years, bearing a very remarkable resemblance to each other, and all proving fatal, my reader will not blame me for entertaining the most gloomy presage, on witnessing this disease, and feeling as it were an unwillingness to come to the rule of practice. The fact being that in the true acute fungus hæmatodes, or soft cancer, when distinctly marked (and it cannot be distinctly marked until it has made considerable progress),

I have the liveliest apprehensions for the life of the patient. Of this we may be certain, that either it is originally a constitutional disease, or very soon becomes so, by propagating its influence to the general system.

It is for these reasons, that finding a tumour of the character of this fungus, we must have recourse to the knife as soon as the alarm is given. If it have got entangled in the muscles and vessels of a limb, it will not be possible to extirpate it; nothing offers hope but amputation.

In amputating, we must go high; and if the muscles exhibit a pale, blanched, and fishy appearance, the amputation will not avail. If the tumour have begun in a bone, nothing but amputation can possibly eradicate it. I am inclined to believe that the disease makes its progress from cell to cell of a bone, faster than it makes its progress to the surface; and that consequently we must cut out the whole bone in which it is seated, to eradicate the disease.

Thus in the second case: the femur was diseased to its head, and nothing but amputation at the socket could then have been effectual. Yet again, when this terrible disease has made its progress the whole length of a bone, I see strong grounds for apprehension that it will appear next in some of the internal structures, even if that bone be amputated.

We find in these cases an additional reason for

apprehension when tumours have their origin in the medulla of bones.

In concluding, I must express my belief, that very often tumours of a different nature from the soft cancer have been described under the name of fungus hæmatodes, and that on this account surgeons have not entertained the same apprehensions that possess me when I see it: they seem to me only to have apprehended the growth and propagation of the disease by contact, whereas we have seen it infect remote parts, and destroy the patient, although the original tumour had been entirely removed. It remains to be tried what form of remedy may destroy this disease; and while I acknowledge the necessity of instituting trials, I am not sanguine in my expectation that we shall be able to reach it.

In considering these cases of tumours arising from bones, it will be natural for the intelligent student to turn to the Principles of Surgery by Mr. John Bell, and consult what is there delivered on *Tumours of the Bones.* He will find there many remarkable cases, and some which ought to have been classed under the head of Soft Cancer, or fungus hæmatodes, and some which were in their nature scrofulous; and others which perhaps belong to another head. But there is a disregard of the most important practical distinctions, arising from an unfortunate theory, that "every tumour must derive its peculiar form from the structure of that part of the body from which it arises; that it is

not seated on the part as a new and accidental existence, but is engendered by its vessels, and is of its actual substance." Such expressions will not stand a moment's examination, however imposingly they sound. I notice them at the same time that I recommend the work to the perusal of the student, that I may guard him against the misconceptions to which they may give rise; and that I may remind him in general, that while there is much that is splendid, and much that is useful and well-deserving to be studied in the Principles of Surgery, so it is a book which should be read chiefly or only by those who are so far advanced in knowledge as to be able to profit by the many excellencies, while they reject the crudities and misconceptions.

REPORT,

OF CASES OF TUMOURS WHICH TAKE THEIR RISE FROM THE GUMS AND ALVEOLI.

During the first years of my residence in London, I imagined that examples of such monstrous tumours as I had seen in Scotland, were much less common in the South, which I ascribed to the difference of climate: the inhabitants of the North being more subject to the extremes of temperature and to scrofulous diseases. The cases which have occurred in the Middlesex Hospital have undeceived me; and the subject now before us, from its frequency and alarming nature, requires the deepest consideration.

It is not only necessary for the surgeon to study the nature and progress of the disease, but to take into consideration the natural structure of the part affected, whether he has to determine the principle which is to guide his practice, or to perform an operation of extirpation. In this last duty the surgeon will find himself engaged in one of the most arduous and formidable operations of surgery.

We see here a small tumour of the gums, stationary for a long time, and claiming no attention; at last, forcing its way into the bones of the face, filling up the cells and the cavities of the nose, pressing out the eyes, and rising at last upon the base of the brain itself. Thus it occupies the whole face, extinguishing in succession, the organs

of the senses; impedes the mouth in utterance; and finally, then indeed happily, it destroys the patient by pressure on the brain; a dreadful picture this at any time! but how peculiarly distressing and painful to a surgeon, conscious that by inattention to the nature of the disease, or by want of boldness in the execution of his task, he has permitted the time for extirpation to pass.

That physiology, which is founded upon anatomy, gives us the principle by which we regulate the treatment of these tumours of the gums. We cannot fail to observe that the teeth, the alveolar processes, and the gum have something in common. I may express it by saying, they have the same constitution. To be convinced of this: if we look first at the jaw-bone, before the teeth are formed, and then at the jaw-bone of one much advanced in years, and who has lost all his teeth, we shall then perceive that the teeth and alveolar circle are superadded parts, not necessarily belonging to the jaw-bone. The base of the jaw-bone is all that exists previous to the formation of the teeth, and all that remains when they have fallen out; so we observe, that if a single tooth fall out, the alveolar process of that tooth decays with it, as it grew up with it and closed around it. In the same manner, the gum and tooth, or the gum and alveolar process are formed together, and decay together, and without the presence of the one, the other will fade and shrink.

This suggests to us that when disease originates

in the gum, it may belong to the tooth, and alveolar process also; and that it will probably attach to these parts, so evidently united in their natural constitution, long before it affects the base of the jaw. It is on this process of reasoning that I have been induced to cut off all the superadded part, viz. the gum, alveoli, and tooth, along with the tumour which springs from the gums. We find that without drawing the tooth, even the more harmless tumour of the gum will spring up again; and if we draw the tooth, the alveolar process will certainly decay; therefore, it is better to take all away at once.

The nature of this tumour of the gums is not very obvious. Certainly, the worst diseases do not come from the irritation of a bad or spoiled tooth. Thus we see a carious tooth attended with ulcer and gum-boil, and abscess in the jaw; with fungous tumour of the gums, even with necrosis of the jaw. We find the inflammation from the same source amounting in severity of pain to that of the tic douloreux. But these are of no account, compared in danger with this tumour of which I am treating. This more formidable disease begins where the adjoining teeth are apparently sound, and when we cannot trace it to any common source of irritation.

This tumour first shows itself in a small hard prominence of the gum, shooting out betwixt two of the teeth; and the teeth being good, is an unfavourable circumstance, for when they have be-

come loose, and are displaced, without being themselves diseased, it implies that the cause is deep, and not to be removed by pulling the teeth. If the teeth be carious and originally in fault, we have a reasonable expectation of arresting the progress of disease, by removing the teeth; but when, independent of the teeth, the tumour has its origin in the membrane of the fang, or in the socket, we cannot hope to extirpate the disease, without removing the whole system of parts, the whole of what is connected in constitution. But further, the following cases prove how such tumours propagate their structure to the jaw itself; to the bones of the face; to the membranes of the nose; there being, indeed, no limit to their progress, but death. There is thus imposed upon us the necessity of performing the operation decisively, as soon as we have ascertained the tumour to be of the formidable nature here described.

A TUMOUR OF THE FACE, ORIGINALLY SPRINGING FROM THE GUM, ATTEMPTED TO BE EXTIRPATED.

A farmer living in the parish of Pinner applied to me for advice, and in the expectation that I would remove a large tumour which disfigured his face in an extraordinary degree. This tumour filled his mouth, and occupied the right cheek. He told me that all the teeth of that side of the upper jaw had been successively drawn, in the hope of removing the cause of the disease. In doing this the teeth were found loosened from the

bone, and very easily detached from the substance of the tumour. The tumour had been a long time of assuming the condition in which it now appeared; but its progress had not been delayed by any thing that had been done.

I found the body of the tumour firm, and that only the projecting knobs or lobes had a spongy elastic feel. Its lower surface in the mouth was ulcerated, and the teeth of the lower jaw were deeply imprinted on it. It had expanded in the plates of the alveolar processes, and heaved up the superior maxillary bone, so as to give a remarkable obliquity to the face.—After fully deliberating on the case, and having made sections of the bones of the face to practise what was fit to be done, and to adapt my instruments, I proceeded to the operation.

An assistant drew back the cheek. I made a cut behind the tumour down to the alveoli. Into the slit I inserted a small saw, and cut across the alveolar process, and entered the saw deep into the body of the maxillary bone. I made a second incision anterior to the tumour and across the gums, and again divided the alveolar process. As yet there was little bleeding, for I had not cut more with the knife than was necessary for the operation of the saw. I now drew the knife along the base of the tumour on the inside, separating it from the roof of the mouth. I did the same on the other side, separating the tumour from the cheek, and cutting to the bone. Next carrying a thin and

fine saw in these incisions, and moving it horizontally, I cut the shell of the bone. Finding that I could not yet detach the tumour, I had recourse to a very clumsy instrument which I had prepared, not much unlike a blacksmith's forceps, the blades of which embraced the tumour without touching it, while the sharp edges went into the jaw, already in part divided. I crushed through the jaw, and brought away the whole mass. The tumour, and the alveolar processes of that side embraced by it, and part of the jaw bone, were brought away, the antrum was opened, and there remained a great chasm: a portion of sponge, dipt in turpentine, was thrust into the space, and then a compress of lint. The lower jaw was brought up, and bound with a double-headed roller, so as to press the sponge and keep it steady. The loss of blood before this apparatus was applied had been very considerable; but the bleeding was by this means effectually suppressed. The patient, though he could not speak, gave signs of great contentment, and was put to bed with a large dose of laudanum.

If this be thought a severe operation, I must affirm that it is not equal to what I should now think myself authorized to perform in a similar case. —The second day I took away the dressings, or rather the stuffings, and then commenced a severe process of dressing; for every day the chasm was burned with muriatic acid, and rudely brushed with tincture of bark and myrrh, and camphorated spirit. For some months this process seemed to

be attended with success, and the chasm filled up with a firm cicatrix: but in eighteen months the tumour had assumed all its terrors. The side of the face was heaved up; the head disfigured; a continued dull pain attended its increase; it became ulcerated and foul towards the mouth. The patient lay much in bed, torpid at last, in part from exhaustion and irritation, and in part probably from the tumour affecting the base of the skull. He was at length carried off by colliquative diarrhœa.

With such an example before me, you will not be surprised to see me anxious to take away the whole tumour, and the part also from which it grows.

TUMOUR IN THE MOUTH SUCCESSFULLY EXTIRPATED.

Seymour's Ward, 6th Sept.——*Burrows.*—This woman has been sent into the hospital by Mr. Golden, of Maidenhead, to have an operation performed upon her mouth.—One side of the upper jaw is occupied by a tumour, which has displaced the teeth, and projects into the mouth. The tumour is firm, and has little sensibility. It bears the form of the teeth of the lower jaw indented on its surface, without exciting pain.

Mr. B. began the operation by removing the teeth connected with the tumour, and displaced by it. He then divided the gum and the alveolar process

across with a saw, to the depth of three quarters of an inch anterior to the tumour. He then cut across the alveolar circle behind the tumour. An incision was then made with the scalpel, which cut the tumour from the cheek : another was made in the angle betwixt the projecting tumour and the roof of the mouth. He next introduced a small saw betwixt the cheek and the tumour, and cut across the jaw-bone above the range of the fangs of the teeth. The whole was then torn away with large forceps.

When the tumour was brought away, a stream of blood jetted from the jaw. It was supposed to be from the alveolar artery, become active and enlarged by the presence of the tumour.

The portion of the jaw and the tumour having been calculated previous to the operation, a bit of cork had been cut to occupy the chasm ; the cork was also cut to correspond to the teeth of the lower jaw. Lint dipped in the muriated tincture of iron was laid in the wound, and the cork forced in upon it. The patient was then made to close her teeth upon the cork, which immediately stopt the hæmorrhage ; a double headed roller split in the middle to receive the chin, was brought over the head, and turned so as to bind up the jaw firmly. Here the cork projected a little beyond the level of the teeth, so that while the lower jaw was kept steady, there was space betwixt the teeth to admit spoon-meat. On the second day the compress was removed. After this the muriated tinc-

ture of iron was applied to the surface once a day, and the patient ordered to brush the part with equal parts of tincture of myrrh and tincture of bark with a little camphorated spirit.

This woman recovered; and when I was in her part of the country ten months after, she came some miles to thank me. Yet I consider a year no security against the return of this formidable tumour.

ANOTHER EXAMPLE OF TUMOUR OF THE GUMS EXTIRPATED.

Eliza Fawcett, aged 48.—*September 24th.*—This is a fat woman with a coarse florid complexion. She has come into the house to have an excrescence taken from the gum. The tumour is smooth and red, and firm in consistence. Its centre arises betwixt the bicuspides of the right side of the upper jaw, and the anterior bicuspis is thrust towards the roof of the mouth. It is of the size and shape of a walnut, has a scirrhous hardness, but is without pain, unless firmly pressed. There is a considerable swelling of the cheek, and the eye of the same side is blind, and stands prominent as if thrust from its socket. Although this appearance be alarming, it is hoped that it is owing to a combination of circumstances. The state of the eye is owing to an inflammation which long preceded the existence of the tumour. However, the patient affirms that the inflammation which destroyed the eye, was owing to a pain in the cheek.

This tumour in the mouth has existed for nearly twenty years; eight years after its commencement, she had it cut off. Two years after this, it appeared again, and it has regularly increased since that time, but very gradually. It is now twelve years since the operation. She is desirous of having it removed, because, of late, it has become much more active, shewing a more evident increase.

Operation.

An incision was made with a scalpel on the outside of the tumour, and above its root, down to the bone: then with a small saw the alveolar process was partly cut from the body of the jaw-bone. A cut was next made on each side of the tumour, consequently embracing two of the teeth. The alveolar process was then sawn obliquely upward, and with the assistance of the bone nippers, the tumour, with the bone and teeth, were brought away. The patient suffered much pain, and there was considerable bleeding during the operation. When the tumour was removed, a small artery from the middle of the bone bled freely. It was stopped by the application of lint, with the tinctura ferri muriata. The lint was supported in contact with the jaw, by a piece of dry sponge, and a piece of cork adapted to the vacuity left by the tumour.

The treatment was the same as in the last case, and the patient was dismissed well, on the 8th of October.

CASE OF TUMOUR OCCUPYING THE BONES OF THE FACE, SPRINGING ORIGINALLY FROM THE ALVEOLI AND GUMS.

Susanna Todd, aged 39. *Bird's Ward.*—About four years ago, this woman had a small tumour of the size of half a hazel nut on the gum over the first molaris of the upper jaw. It continued to increase for two years. At this time a medical gentleman thrust his lancet into it, but nothing but blood flowed from it. The wound did not heal, and from that time the tumour rapidly increased for the space of a year, bleeding from time to time. She observes, that these bleedings always relieved her, so that she was at this time suffering pain. The tumour had now enlarged the alveolar process, and appeared as a tumour on the cheek. She went into an hospital, and they drew two of the molares, and cut away a portion of the gum; but she derived no further advantage from this, than that for a time she was freed from the portion of the tumour which projected into the mouth, and plagued her in eating. She was eight months in the hospital. While she was attending there, they thrust a probe into her nostrils, to which she attributes the blindness of the left eye: but this is evidently a fancy of hers.

From the hospital she was carried to the workhouse, and nothing further took place but the gradual increase of the tumour, which about three weeks ago produced a dimness of vision in the

left eye, and in three days the sight was totally lost.

She has now a large tumour of the whole left cheek, which appears like an irregular swelling of all the bones of the face. The alveolar processes are much enlarged, and project so that the upper jaw shoots far before the range of the lower jaw. The tumour extends from the base of the lower jaw to the inner canthus of the right eye: it presses in upon the orbit, and has in some degree displaced the left eye. It has thrust the nose aside also: a fungous irregular tumour occupies the whole of the left side of the mouth, and affects all the palate: it has shot back into the fauces, and presses upon the mouth of the Eustachian tube of the left side. See Plate X.

March 15. The tumour has considerably increased; for although it be flatter at the lower part of the cheek, towards the eye it is enlarged, smoother, and more discoloured; the fungus in the mouth is more luxuriant.

April 15. She is more inclined to dose, and is for the most part in bed.

Consultation.

It is concluded that this tumour is beyond remedy by operation. But considering the melancholy condition of the patient, and of how much importance to the pupils it is to have a clear conception of this matter—I subjoin a detailed statement.

Would it effect a cure of this tumour, or would it materially diminish the rapidity of its growth, were we to tie the external carotid artery of one or both sides?

The tying of the vessels of a tumour, which is a consequence of dilatation, or mere excess of action, as of aneurism, aneurism by anastomosis, and varix may be effectual. But where there is a new and specific action at work, building up a tumour, we cannot expect permanent advantage from intercepting its supply of blood. The many collateral sources by anastomosing vessels would quickly pour in their contribution, and the original disposition of the tumour would return, or more probably indeed would never be intercepted.

If the operation of extirpation were to be attempted, how ought it to be executed?

In such cases, it is impossible to say exactly how the operation would be accomplished, for it might be necessary to change the plan of operation; but, however, in such desperate cases it is right to plan the operation, and endeavour to anticipate every occurrence.

The bare statement of what would be necessary will best explain the formidable nature of this disease; and how necessary it therefore is to extirpate this kind of tumour at an early period.

1. By an incision in the neck, lay bare the carotid artery at its bifurcation, and surround the external carotid with a ligature.

2. Cut across the cheek from the left angle of

the mouth, and expose the tumour in the mouth: preserve the parotid duct entire, and on the lower flap.

3. As it is probable that the walls of the maxillary bone are absorbed, it would next be necessary to dissect off the cheek from the tumour. It would now be necessary to divide the os malæ and the nasal process of the superior maxillary bone.

4. The palate plate of the superior maxillary bone must next be divided.

5. The worst remains: it would be necessary to break off the left maxillary bone, and the tumour, carrying away the orbital plate, and separating it by violence from the palate and sphenoid bone. In doing this, the infra orbital nerve would hold like a cord, and it would be necessary to introduce the knife betwixt the eyeball and the orbitary plate, to cut across this nerve.

6. There would be bleeding, although the internal maxillary artery was tied; first, from the anastomosing branch of the other side; secondly, from the ascending branch of the internal carotid of the same side; and lastly, from the ophthalmic branch of the cerebral artery. The bleeding could be suppressed by the sponge, and the cheek would be reunited by the intercepted suture.

This is at least looking the difficulties in the face. So far I have no hesitation in saying, the operation might be accomplished. But could the patient bear such violence as would be necessary

in the performance? Were this operation actually performed, and the woman laid in bed, my fears would then be no less than they are now. There would arise great inflammation, and it would reach the base of the brain, and she would become lethargic, and die.—The weak condition of this poor woman makes such an operation quite out of the question; and we must let her die, as one now beyond all remedy.

The use of such a detail as I have entered into in the last case is to teach the pupil to look forward to these difficulties, and to foresee them by the dark shadows they cast before them: for example—

Surgeons' Room, Saturday, 8th March.—This young woman has a tumour of the gum projecting betwixt the cuspidatus and the bicuspis of the right side of the upper jaw. It is of a pyramidal form, red at its base, and like the natural gum, and white upon its apex, as if it contained matter. But there is no matter, and the whiteness is an effect of the greater density of the projecting part. On pressing the tumour, she has pain, and already the bicuspis is loose: it has been a year in growing. She cannot ascribe it to any cause.

Now here the misfortune is, that her teeth are beautifully white and perfect, and she cannot consent to have two of them taken away with their processes of bone! The tumour was cut off, and the

teeth and alveoli laid bare, and touched with the muriated tincture. But I have forewarned her that it will grow again, and if it do, I have her promise to return, and to submit to a more severe operation.

REPORT

OF GUN-SHOT WOUNDS OF THE KNEE-JOINT.

Under this head, I mean to make a very few general remarks, and to give one case in detail; which in my judgment is important, as much from the many eminent surgeons of this country, and of the continent, who have passed their opinion upon it, as on account of the history itself, and the consequences which resulted from an improper interference with the wound.

We have very few cases recorded of gun-shot wounds followed in detail, which is much to be regretted, since it is impossible to form a correct judgment of what ought to be done in the first period, without a knowledge of the after symptoms, and of that protracted suffering to which the patient is sometimes doomed.

There is no point of practice better determined than this: that when a musket ball is lost in the fleshy substance of the body or limbs, we are not to make search for it by much poking with the probe, nor at the expense of free incisions. If the ball be deep, it will remain long, perhaps for life, without producing even uneasiness; if it lie under the skin only, it will show itself in time, and make its way to the surface, or it can be cut upon and extracted.

But does this rule hold in regard to the wound of joints and the heads of bones engaged in the articulation? I apprehend not. In a joint where the parts are in motion, and of a peculiar texture, the presence of the ball will give rise to great inflammation, and to continual and protracted suffering and lameness. If possible, therefore, the ball is to be discovered, and extracted before the inflammation shall have arisen.

The whole question turns upon this word possible; it betrays the secret that every thing depends on the judgment of the surgeon; for in one sense it is always possible to extract a ball, but as it must be with more or less injury, so it remains to be determined what the degree of injury will be, and what the constitution can support. It is evident that the question must be determined by the experience and knowledge of the consultants upon the individual case. The principle may be stated; but to frame an absolute rule is just as likely to lead to error, as to direct the practice aright.

I am here only collecting the data, to enable us to reason correctly hereafter. I had intended to have given a catalogue of the examples of wounds of the joints and fractures of the bones by gun-shot, which are in my collection, but this I must defer.

In the mean time, the rules on the subject of amputation in gun-shot wounds have been laid

down in a work lately published under an implied sanction, and the protection, of those in authority. This comes of a very mistaken notion of duty, and is an unwise thing, inasmuch as it gives more weight to an opinion than the experience and ability of an author carries with it. Powerful as the agents of Government may be, they cannot settle a controverted question of surgery: they have already become deeply responsible for opinions which by their interference must become more extensively pernicious than they otherwise could be.

CASE OF THE BARON DRIESEN, GENERAL IN THE RUSSIAN SERVICE.

This gentleman was wounded in leading his regiment to the attack of a French position at the memorable battle of Borodino, on the 6th of September, 1812. His elder brother fell in this battle, a younger brother was promoted on the field, for his conduct, and his brother-in-law commanded the redoubt, against which he was leading his regiment. A musket-ball, as it was supposed, struck him in the most prominent part of the inner condyle of the left femur. It threw him down. When carried to the rear, the surgeon told him that it was a wound of little importance, and that the ball would come out of itself. When carried to Moscow, his sufferings became extreme, the wound closed, and the

knee swelled in an extraordinary degree. But now the confusion in the city was very great, and a surgeon could not be found. Cataplasms were employed, and they had the effect of relieving the wound by opening it, and bringing on discharge. Just then his aide-de-camp came to tell him that the army had retired to the other side, and that the city was abandoned, and had capitulated. He was now carried to the town of Murom, and here he was visited by one of the most famous Russian operators, Muchin; but by this time eight days more had elapsed, and although the surgeon tried all his art, he could not feel the ball, for after the swelling, the matter had formed a canal in a direction different from the wound. He employed sponge, to dilate the wound, and to facilitate the operation of sounding with the probe. But in the end, he was obliged to leave the General, and return to Moscow. Here, in January, 1813, the thermometer at 26 below freezing, the General joined his surgeon again, and now he could discover what he thought to be the ball. Muchin attempted an operation of extraction: but after introducing various instruments into the canal in the bone, he found the ball immoveable, and not wishing to hazard the operation of the trepan, he desisted, hoping that by the discharge of matter, and the effort of nature, the ball would become loose; and in the mean time he used injections of myrrh and bark, and the compress, to close the other

sinuses, which the inflammation had produced; and in effect, all the matter was dislodged from the sinuses of the thigh, and from around the knee, and nothing remained but the canal of the original wound, and the ball at the bottom of it.

In the spring, the General was greatly better, and able to move on crutches; and by July travelled to Petersburgh. Here he consulted Mr. Bush, Professor of the Academy, who, after holding consultations, and making accurate observation of the situation of the ball, made many attempts to extract it, but all in vain; and at length he gave it as his opinion, that without bringing him into extreme danger, the ball could not be extracted, and that it was better to wait some effort of nature. In this interval, another surgeon was sent to him by the minister of war, and he thought of using the sponge-tent; but, on the third day, a formidable inflammation declared itself; and now the sponge had swelled, and could not be withdrawn; but was at last torn from the wound. He suffered much in consequence of this, but by cataplasms the inflammation was subdued, and on recovering from the fever thus occasioned, he resolved to follow the Emperor, and arrived at the head-quarters then in Troyes, in February 1814.

Here his Majesty the Emperor ordered his surgeon, Sir James Willie, to report upon the Gene-

ral's wound, and his opinion was, that the only question remained betwixt amputation and the use of the trepan, and that the latter was not without danger. And further, Sir James Willie advised, as the head-quarters were moving from day to day towards Paris, and as it was impossible to give that degree of attention, and to insure that repose which was necessary in the event of an operation, to intrust the General to the English surgeons. However, before he could make his passage to England, he fell ill, and became the patient of a French surgeon, M. Laroche. He again attempted to use the sponge, but with no better success than heretofore.

On the Baron Driesen's arrival in London, I found that he had suffered much from his journey, and that his health was broken by the long continuance of the irritation of the wound. He had a countenance of much suffering; his pulse was quick; he was subject to frequent attacks of fever, ushered in with rigours, without being aware of their connexion with his wound. The examination of the state of the wound was made with gentleness, on account of the irritable state of the patient. But even the introduction of the probe, and only touching the ball, brought on an attack of fever. I removed him to the country. I was not insensible to the honour done me by the Baron Driesen being put under my care; yet I considered him as a public charge, and wished him to have the opi-

nion of those who are the ornament of our profession.

When he was so far recovered as to permit me to make a particular examination of the position of the ball, I found that when he received the wound, he had stood looking back to the column which he commanded, and with his right side to the enemy, and that the ball had struck the inner condyle of the left thigh-bone exactly upon its utmost convexity. The probe being introduced into the wound, passed three inches and a half before the rub of the ball could be felt. The probe passed a little obliquely downwards and backwards through the substance of the head of the femur. I was of opinion that the ball was lodged in the bone, being arrested by the attachment of the crucial ligament to the notch of the femur.

Now fully aware of the difficulty of the case, I yet thought it possible to extract the ball by trepanning the femur. The consultants saw much danger in the operation. An attempt was made, by the advice of Sir Everard Home, to enlarge the wound, by the use of the lapis infernalis. The consequence was, a severe attack of erysipelas, which extended from the groin to the toe.

Upon his recovery from this attack, I made various attempts to extract the ball; but the great depth in solid bone, the sensibility of the parts, and the high susceptibility of the constitution to fever, the very frequent attacks of

erysipelatous inflammation, and the fevers which were the consequences of these attempts, forced me to desist.

In consultation, tents were proposed, but I could not give myself up to the belief that they would prove of service in dilating a hole in the solid bone, and our patient understanding the nature of our discussion, put an absolute veto, on the strong grounds of former experience. Finally, the question being for operation or no, my friends advised me so strongly against it, that I confess I lost confidence.

We now united in opinion that the wound should be permitted to close. Our expectation was, that the dressing being removed from the wound, the ball would be enclosed in a solid mass, and that by a contrivance to keep the knee-joint perfectly still, and the limb extended, he would regain in a very considerable degree the use of the limb, and get free of the fever and irritation. I added further, the comfortable reflection that if the wound broke out again, it would probably open on the other side, and that means might then be afforded to the surgeon to extract the ball, without bringing it through three inches of bone.

Baron Driesen returned to the Continent. All the year 1815, and till March of 1816, the wound remained closed. But then it opened, and this was preceded with great swelling and inflammation of sixteen days continuance. During this long suf-

fering, not only the old wound opened, but an abscess was at the same time formed on the outside of the knee. Here M. Gessling, surgeon of the Imperial Guard, made an incision, giving discharge to a very great quantity of matter. By this incision, the patient was greatly relieved, and the swelling subsided.

The Baron having in a great measure recovered, M. Krestowsky, a surgeon, conceived the idea of dissolving the ball by pouring quicksilver into the wound. This unfortunately was put into practice, and the consequence will be presently too obvious.

Baron Driesen returned to London in September 1816. He shewed me a great quantity of mercury, which had at different times issued from the sinus on the outside of the knee-joint. It appears that a very considerable quantity had been poured into the wound from time to time, for long after his return, it continued to escape at each dressing, and its presence evidently occasioned more distress and swelling, and discharge of matter, than otherwise should have been occasioned by the presence of the ball.

In the month of December, my patient began to suffer in an extraordinary manner. Violent paroxysms of pain came on suddenly, and continued for one or two nights; after which they subsided: these returned again and again with increasing violence. The excess of pain was such as to leave him on one occasion in a state of insen-

sibility for a quarter of an hour. During these attacks, the seat of the pain was principally in an abscess which had formed round the head of the fibula. It appeared that the fibular nerve was involved in the inflammation, for this part was not only very sensible when touched, but a burning sensation shot to his foot, and through the whole course of the nerve.

I enlarged the sinus, and discharged matter mixed with quicksilver, which for a time relieved him; but his sufferings some time afterwards became so great, that I called Mr. Cline into consultation, to determine on the propriety of an operation.

In the consultation Mr. Cline confirmed my fears. The parts were inflamed and irritable, the ball still firmly impacted in the centre of the external condyle of the femur, and the original wound open. We considered the possibility of cutting upon the ball from behind, and from the outside of the knee: but as it would have been necessary, in order to do this, to cut into the substance of the bone, as it might prove that the ball would be found flattened, and its diameter thereby increased, so that the trepanned hole would be too small to permit its extraction: and as in making the incisions on the back and lateral part, it would be necessary to expose and displace the popliteal nerve, evidently inflamed, we concluded that it would be improper to attempt the extraction of the ball. It also appeared that much of his suffer-

ings proceeded from a cause, viz. an irritation upon the nerve included in the abscess, which would not be removed by the extraction of the ball. We therefore still recommended delay, in the hopes of the parts becoming more tranquil, and in the belief that still some favourable change might take place in the situation of the ball.

But these expectations were rendered vain by the rapid return of the attack of pain, and with still increasing violence, which brought an urgent request from the patient himself, that I would remove the limb. The pain was beyond all endurance, and he could not long have survived under it.

It remained for me to determine whether or not I should cut into the limb, and extract the ball before commencing the amputation; that in the event of the extraction being practicable, and done without much injury, I might still save the limb; or, on the other hand, that if the attempt proved impracticable, I might have recourse to the amputation. But when I saw him in his fit, so shaken by the paroxysm, and that it was attended with nervous twitches of the whole frame, I concluded it was no time to attempt a protracted and uncertain operation.

The amputation was performed on the 7th of January.

Dissection of the Limb.

I attempted the operation on the amputated

limb which I had so long contemplated in our consultations. I enlarged the sinus on the outside of the knee, so as to admit the finger betwixt the popliteal vessels and the lower head of the femur; but no indication of the presence of the ball was to be felt. I introduced the probe along the tract of the wound, and tried to push it into the sinuses behind, and towards my finger introduced into these sinuses. It was evident to me, that if I had attempted any such operation I should have failed, and committed such mischief as would in all probability, in addition to the original cause of irritation, have proved fatal.

In prosecuting the dissection, a great quantity of mercury was found lodged in different abscesses around the joint. There was an abscess betwixt the heads of the gastrocnemius muscle; and a sinus, the remains of an old abscess, ran up very high by the side of the popliteal vessels. But what had evidently proved the chief source of distress latterly, was a diseased portion resembling fungus, which surrounded the fibular nerve, and in which was contained innumerable small globules of mercury. The trunk of the popliteal nerve was surrounded with a diseased portion of the same kind, in which also clear globules of mercury were contained, and in great quantity.

On calculating the level of the ball, the femur was cut so as to disclose it. It lay in the centre of the outer condyle; a layer of soft membrane like red velvet surrounded the ball. It was, notwith-

standing, firmly impacted; and although one half of it was exposed, it stuck firmly. There was a small cavity in the bone behind the ball, which communicated with the joint and with the sinuses.

The patella, and femur, and tibia, were united by bone; so that the Baron must have been deceived when he thought he had motion in the joint. The periosteum over the head of the femur was in a state of inflammation, and the parts around were diseased and thickened. The popliteal vessels and nerve were, through their whole extent, involved in condensed cellular membrane, making a firm mass. The preparation is in the collection. —See Plate XV.

On reviewing this case I find nothing to regret, either in the opinions which were given from time to time, or in the final decision to amputate the limb; at any time the operation of extracting the ball, would have been most severe and hazardous. In the latter time, and after the mercury had been poured repeatedly into the wound, the extraction would have been attended with much more danger, and certainly with an aggravation of the pain and inflammation. For latterly my patient's sufferings arose from the mercury lodged around the nerves, and the mass of inflammation and suppuration in which they were engaged. This was obvious, both from the character of the pain, and from the part affected. It was not a continual pain which afflicted him. He had intervals of ease, during

which he could, in some measure, enjoy society; when suddenly violent strokes of pain would drive the blood into his face from the agony he suffered, and throw the whole muscular frame into a convulsive tension; this would continue for longer and shorter intervals, during the space of three days and nights, and then gradually leave him to more repose. But again to be resumed with violence, with more inflammatory tension, with more exhausting fever, which would soon have destroyed him. The part affected, during these paroxysms, was not the wound, properly speaking, but the tract of the nerves; and the more violent pain was generally in the course of the fibular nerve, and on the dorsum of the foot. Sometimes it was a gnawing pain, with contractions in the muscles; generally he described the sensation as a succession of blows.

After amputation, this character of pain continued with very peculiar and distressing consequences. During the operation, I observed that the popliteal nerve stood out rigid from the stump, owing to the inflamed state of its sheath, and that the nerve was in fact inflamed. The face of the stump healed by the first intention, and was round, full, and fleshy; but by and bye the strokes of the pain were resumed, attributable to the same part of the dorsum of the foot, and attended with the exact same contractions of the toes, and all his former sensations; and as it were in the same precise parts, so that he thought it hard that the same *mau-*

dite pied, should afflict him still after it was burnt, and the ashes scattered!

These nervous attacks had a very particular effect upon the stump, for, as formerly, the whole limb swelled up under this influence of pain; now, when we thought the cure was to be unexampled in rapidity, the whole stump and thigh began to swell. Suppuration formed under the integuments; as I always keep a piece of dressing in the lower part of the wound, even when the ligatures have come away, this provided for a more easy discharge of the suppuration than otherwise would have been. It was natural to expect that when the swelling and suppuration subsided and discharged, my patient would have made a uniform amendment; but no, again the pain struck into the foot, again the toes were pinched and cramped; the stump swelled; the matter collected, and it was necessary to open the depending part of the integuments of the stump, to give vent to the matter; and this attack and their consequences were several times repeated.

But in good time the stump fell to a natural size, and the returns of the shooting pain had not the effect of exciting to suppuration. He has of late recovered strength rapidly, and this 3d of May, he leaves England for St. Petersburgh, and may his future life be such as to balance the sufferings he has endured for these last four years. In the midst of which he has so borne himself as to leave, with his friends in England, the greatest possible esteem and attachment.

REPORT

ON SACS FORMED IN THE URINARY BLADDER; ON INCYSTED CALCULUS; ON SOUNDING FOR THE STONE; AND ON THE METHOD OF PERFORMING LITHOTOMY WHEN THE STONE IS SACCULATED.

In entering on this subject, which is so much talked of, and yet so vaguely, I shall endeavour to keep myself to facts, and to the practical views, by having these examples before me.

XIV. 1. M. 81. This preparation is an example of what has been described as a double bladder. These bladders are of equal size, and have a common septum, which is perforated, and the hole is an inch in diameter. We observe, however, that the ureters, the urethra, and the vesiculæ seminales, belong to one of the sacs, by which we discover that it is the true bladder of urine, and that the other is a sac, or pouch, enlarged in an extraordinary degree. No stone was found in this sac.

XIV. 1. M. 82. A bladder of urine, which had suffered much distention in consequence of stricture in the urethra. A remarkable pouch projects from it. No stone was found in the sac. The bladder has been distended, dried, and varnished.

XIV. 1. M. 75. This preparation, of which an etching is subjoined, is illustrative of two remarkable occurrences—that a stone may be sacculated

betwixt the coats of the bladder—and that a stone may adhere to the internal surface of the bladder. Here are two large calculi adhering to the surface of the bladder, and upwards of thirty smaller calculi attached in the same manner. Near the neck of the bladder there is a sac formed in the coats, nearly two inches in diameter, and which communicates with the cavity of the bladder, by an opening not a quarter of an inch in diameter; filling the cell there is a calculus, which it is quite possible the sound might have touched the surface of, had an attempt been made to sound for it in the living body.

XIV. 1. M. 67. This preparation I have also had engraved [Plate X.] The prostate gland is in some degree enlarged. The bladder is thickened, and the ribs of the muscular fasciculi have become very large and distinct, as is evident, when we look upon the inner surface. At the fundus, the bladder opens by a hole, into a large sac, the edges of which are ragged, as if ulcerated. This sac formed a cavity betwixt the fundus of the bladder, the peritoneum, and the abdominal muscles. It contained a calculus, weighing four ounces. At one part, the stone was only covered by the peritoneum, which was inflamed, and seemed to threaten ulceration.

This patient had the symptoms of stone in the bladder strongly marked; but no stone could be discovered, until sounded by Mr. Wilson. He was 80 years of age.

XIV. 1. M. 73. A very valuable specimen of

the urinary bladder [See Plate XI.] contracted and thickened, and containing a calculus in a sac, or pouch, near the fundus. Part of the calculus might have been felt by a sound introduced into the bladder. But the pouch is so contracted round the stone, and its orifice is so much smaller than the diameter of the stone, that had the operation of lithotomy been performed, it is very doubtful whether the forceps could have embraced it.

XIV. 1. M. 76. The bladder of a patient who died with the symptoms of stone. From the inside of the bladder hang innumerable membranous processes. A hole, formed by ulceration, communicated betwixt the bladder, and a cavity situate betwixt the bladder and rectum. A small calculus was found in that part of the urethra which is embraced by the prostate gland.

XIV. 1. M. 71. The urinary bladder, with many spots on the inner surface, having gritty matter adhering to them.

XIV. 1. M. 72. The bladder much thickened, and containing a calculus.

XIV. 1. M. 74. The bladder of urine opened laterally, exhibiting a very large rough stone. The bladder is very much thickened, and the stone occupies the entire cavity. This stone was extracted by the operation of lithotomy, and is here replaced, to shew the difficulty of seizing a stone so situated, with the blades of the forceps, and the degree of violence which must be endured to bring it through the incision.

XIV. 1. M. 69. The bladder of a child, on whom the operation of lithotomy was performed. It is very thick in its coats, and the cavity small. The surgeon desisted from the operation, thinking that the stone was incysted. The child died, and the stone was found in the cavity of the bladder.

OF THE FORMATION OF THE SACCULI IN THE BLADDER.

Authors have supposed, that the calculus, when incysted, as in the instances which I have here described, forms a lodgement for itself; and that, from being free in the cavity of the bladder, it becomes fixed. This may, in some rare instances, be the case, but certainly does not correspond with the facts before us. In the first place, we see sacculi formed in the coats of the bladder, where there was no stone. In the next place, we see that the stones contained within these sacs are all much larger than the hole of communication betwixt the bladder and the sac. So that, if the stone were not formed there from its commencement, it must have acquired its principal increase after having been deposited.

It appears that the pouches are not muscular, but consist of the inner and peritoneal coats; the inner coat being thrust through betwixt the fasciculi of the muscular coat, is consequently brought into contact with the peritoneal coat, or, at most, only a very thin cellular coat intervenes.

It is important to observe, that in some of these

specimens, the preternatural sac had become very thin, and little prevented the escape of the urine or the stone.

It is pretty obvious how these sacculi are formed. In some of the examples, indeed, we have almost a demonstration. In the first place, we see that there is an obstruction to the discharge of urine from the bladder; in the next place, we see the natural consequence of this to be, the increased thickness and strength of the muscular coat. Now the muscular coat of the bladder consists of reticulated fibres, and in the interstices of the meshes there is nothing to restrain the inner coat from being protruded, when the muscular coat has assumed this form, with a great addition of power, in its contraction. It is obvious too, that when this protrusion has once begun it will continue, and in one case it has continued until the sac equals the bladder in size.

When the sac is formed, the production of a calculus in it will depend on circumstances. But this is obvious, that such pouches are favourable to the formation of calculi, and that when they are formed, they will increase by new depositions, and first fill the cell, and then by their increase enlarge it.

These are examples on which we have now to reason. They show that the stone is sometimes incysted; but I shall venture to add, in way of commentary, that the occurrence is rare, and that we hear a great deal too much of it. For it is pos-

sible that the incisions of lithotomy may be made in such a manner, and the forceps so used, that when the surgeon puts the finger into the wound, after many unsuccessful attempts, he may persuade himself that the stone is sacculated, when in truth the bladder itself is the sac! A long time ago, I got the body raised, after a scene of this kind, and the stone was found in the bladder; the bladder was thick, but there was no sac. See the Preparation, XIV. 1 M. 69. How these mistakes are committed, I may hereafter have an opportunity of inquiring, in a Report on the Operation of Lithotomy.

Surgeons should not consider themselves quite at liberty, during an operation of lithotomy, to call out that the stone is sacculated! That is, they are to blame, for not having discovered that before, which is so necessary to the right performance of the operation. But this is quite of a piece with the whole modern operation with the gorget, which has been invented, and too long practised, under a total disregard of the more important varieties in the condition of the bladder, and the size and situation of the stone.

He that can sound for the stone well, will have no difficulty in the operation of extracting it. But undoubtedly, there prevails, very generally, a misconception as to the degree of information to be obtained by the sound. Surgeons conceive, that if they chink upon a stone, the affair is settled; yet I am never satisfied, unless I can put the sound above and below the stone, thus ascertaining that

it is free in the bladder. It is possible also to ascertain the size of the stone, with some degree of certainty. If we feel that the stone is under the curve of the instrument, we then strike it downward, moving the handle of the instrument at the same time, so as to make the further extremity revolve on an axis, which is in the membranous part of the urethra. In thus moving the extremity of the instrument in the bladder, through a certain degree, we must alternately lift and strike the instrument downwards; thus will the instrument be made to move over the surface of the stone, which is otherways carried with the instrument, and we deceive ourselves by touching always the same part of the stone. If the staff slip into the bladder, under the stone, it is nevertheless possible to move it like an index over the face of the stone, and thus to form some estimate of its size. That we cannot be quite certain, I acknowledge, as the experience of this day, in which I am writing, might prove. I sounded a boy eight days ago; I could move the sound over two rough convex surfaces, and I thought that I discovered two small stones; the second time, five days after the first examination, I felt only one stone, and by moving the convexity of the staff over it, I was convinced the stone was small. The stone was extracted this morning by Mr. Cartwright. It was small; on one extremity there was a uniform protuberance, and on the other, there were two having a certain depression betwixt them; the stone was of a heart-

shape: and when the base presented as in the first instance, the staff travelled from the one convexity to the other, so that I fancied I discovered two stones. When the apex lay towards the sound in the second examination, I felt but one small stone.

There is a circumstance which should ever be attended to, and taken into our estimate, viz. the roughness of the stone. In this calculus the crystals were sharp and prominent, and they conveyed so peculiar a sensation, almost painful, that the conclusion I drew from the two convexities being felt, was negatived by the state of the surfaces, for two stones become polished by their friction; yet not exactly as stones are rounded on the sea shore, by waste, but by their contact and motion preventing the crystals from projecting. Although those circumstances gave me some difficulty in determining that the stone was single, yet they do not the less countenance the belief that it is possible to ascertain a great deal by dodging the staff over the surface of the calculus. And in the three preceding cases of lithotomy, I had, with considerable accuracy, ascertained by the sound what I found on extracting them, in respect to their number, size and roughness, and freedom in the cavity of the bladder.

In the preparation, XIV. 1. M. 76. a small calculus was found in the urethra. This is a circumstance which has proved very unfortunate; for the surgeon having distinctly felt the stone in the *rub*

of the staff, has concluded there was a stone in the bladder. The operation has been performed, and no stone discovered, until they looked in what was discharged with the urine on first cutting into the bladder. One should imagine this a mistake which could not be made by a surgeon who knew the length of the urethra, and the place at which the point of the staff enters the bladder: for if the surgeon be sensible of this *rub* of the instrument before the point enters the bladder, he must conclude that the stone is in the urethra, or in the ducts of the prostate gland (which is a frequent occurrence) *.

Sometimes the stone meets the point of the staff or sound just as it enters the neck of the bladder. This will make the operator pause to consider the situation of the stone. If in changing the direction of the sound, it enter grating along the surface of the stone; if the bladder of urine be thickened and contracted, and unable to contain a few spoonfuls of urine, it countenances the belief that there is a very large stone in the bladder. This is made more likely by the long suffering of the patient; by the lateral motion of the sound giving

* I had a specimen of stones in the ducts of the prostate, which is lost. It corresponded with the fig. 2, plate 11, of the fas. of the bladder in Dr. Baillie's Morbid Anatomy.—A stone sometimes lodges in the urethra, and producing ulceration, sinks into the perineum; but continuing to project into the canal, it may be mistaken for a stone in the bladder, by those who sound carelessly.

the idea of a broad continuous surface, and proved finally by the finger in ano. Last summer I had a case of this kind; the bladder was thickened, and the cavity small, and the stone very large. The bladder did not admit of distention; the urine came away continually; when I introduced the sound, I felt the stone; but the instrument was grasped betwixt the bladder and the stone, so that I could gain no advantage by the motion of the staff over the face of the stone.

But in these examples, where the stone is below the sound, and meets the instrument on its entrance into the neck of the bladder, it is possible to correct our observation by the examination per ano. In this manner I have sometimes held the stone betwixt the finger and the sound, so as to ascertain its place and size with considerable accuracy*.

Let us now inquire how far it is possible to ascertain that the stone is sacculated, and what is to be done in such a case.

Garengeot being taken to Mantua to perform the lateral operation for the stone, perceived that the stone could be felt just as the staff passed the orifice of the bladder, but not when the instrument was advanced into the bladder, and he found that the instrument moved in a large bladder, which idea was confirmed by the large quantity of urine dis-

* See further in Report on Disease of the Neck of the Bladder and diseased Prostate.

charged at one time. He drew the conclusion that the stone was fixed in its place, and lay behind the os pubis.—He announced to the surgeons present that they must not expect him to operate in the manner he had done formerly, for he foresaw difficulties in getting hold of the stone, which he suspected was incysted. In effect, the operation was long and laborious; for a second stone, of the size of a hen's egg, was incysted, and he had to cut the margin of the cell before he could extract it. It is thus, that when difficulties are foreseen by men of knowledge and dexterity, they gain honour instead of discredit. I mention this circumstance, to shew that the operator is expected to know when a stone is incysted.

When the stone is not found to change its place in the bladder, nor to stop the urine while it is flowing; when in sounding, it is felt always at the same point; when that point retires if the bladder be full, and approaches if it be empty; when in many trials it is impossible to get the sound round the stone, but only to touch it, we must doubt whether the stone be free in the bladder.

There is an instance reported of a M. Bouden, in the Mem. de L'Acad. de Chirurg. in which he seized the stone with the forceps; but it broke, and only a few pieces of the stone came away: introducing the forceps again, he could feel the stone, but could not get hold of it, which led him to believe that it was contained in a sac, and that his

efforts would only further fatigue the patient. He desisted, and put the patient to bed; but the patient's sufferings did not cease, and he died in the morning. On dissection they found the stone in a membranous sac, and of remarkable irregularity: but this surgeon became wiser by experience; for, in a second case, by sounding he discovered that the stone was sacculated, and refused to operate. In the end he yielded to the patient's entreaties, and did operate; but the stone could not be extracted, and the man died on the 4th day.

M. Littre proposes to disengage the stone from the sac, by introducing the finger into the rectum while the sound is in the bladder; and then by pressing the bladder from without, and by the aid of the sound within, he thinks it possible to dislodge the stone from its sac. In this attempt he proposes to introduce the point of the sound under the margin of the sac, and to enlarge the opening, or tear its margin; and having succeeded, he inclines to let the patient recover from this violence before he performs the operation.

This is hypothetical, and can only succeed when the stone lies behind the prostate. In the event of such sacculated stones occurring, as I have described from my collection, this attempt would be quite fruitless, both because the finger would not reach them from the rectum, and because of the narrowness of the opening into the cell.

He has another clumsy scheme. He proposes to perform the operation in the usual manner; then

to seize the sac and stone together, and drawing them down afterwards, to squeeze the sac; and finally, to tear the margin of the sac, to let the stone escape.

M. Foubert proposes, in the case of sacculated stone, to perform the operation of cutting on the gripe—that is, to introduce the finger into the anus; and by bringing the tumour with the stone forward into the perineum, to cut directly upon it, and to extract it. This can only be possible when the stone is sacculated at the neck of the bladder.

As I believe it possible in most cases to ascertain, not only whether the stone be contained in a pouch, or lie in the cavity of the bladder: but further, that it is possible to determine in what part of the bladder the stone is sacculated, I shall proceed to offer some suggestions for practice.

The stone may be sacculated at the fundus of the bladder, or it may be in a pouch behind the prostate, or it may be at the neck of the bladder, and in the perineum.

If the stone lie sacculated in the coats of the bladder, at or near the fundus, I apprehend the symptoms will not be very distressing. But, if it should produce so much distress as to call for the operation, I am of opinion that the high operation should be performed. It would in this case be very easily performed. This is the method I should recommend.

1. Introduce a staff (in a full bladder), until it

touch the stone, and enter the sac. 2. Carry down the handle of the instrument, until the farther extremity be elevated behind the pubes. 3. Make the incision above the pubes, and raise the peritoneum, if it be not already raised by the distention of the bladder. 4. Now the extremity of the sound being felt through the coats of the bladder, or rather through the thinner coats of the cell, cut upon it with the sharp bistoury; enlarge the wound with the probe-pointed bistoury, and seize the stone. The stone being in a manner already out of the bladder, and betwixt it and the peritoneum, I foresee no difficulty in doing the operation, and think it probable, on this same account, that there would be less danger than in a common operation of lithotomy.

But to the success of this operation, it would be necessary to keep a catheter in the bladder. So that the bladder might never be permitted to rise by distention again, until the wound be united. For by the high operation without such a precaution, the urine is apt to get betwixt the bladder and peritoneum, and to occasion great mischief.

Supposing that the stone is sacculated at the neck of the bladder, it may be very difficult to ascertain the fact with so much certainty as to induce us to operate. That is, the pain and distress may lead to an examination, and the rub of a stone be felt; and on examination by the anus, a tumour may be discovered near the neck of the bladder. Suppose that we pass a sharp instrument

into that tumour from the gut, before undertaking the operation? I see no objection to this, and in these circumstances, I would carry the tenaculum upon the finger within the anus, and then push it into the tumour; the stone would be readily distinguished, and being ascertained beyond a doubt, the operation would be easy.

In such a case, the staff being introduced, and the patient put in the usual position for lithotomy; the operation would consist in the usual first incision for the stone, only carried directly upon the face of the calculus, when it might be extracted without cutting into the bladder at all. Contrast this with what has happened: a stone felt in sounding: the operation performed with the gorget: and that instrument driven against a stone in the perineum, instead of entering the bladder!

If a calculus be sacculated behind the muscles of the ureters, it would, I believe, be possible to cut upon the gripe; that would be determined by the possibility of bringing forward the stone into the perineum. I have done lithotomy in this manner, in a child, with success; and also in the dead adult body, to shew its practicability. If the stone be merely protected from the sound by the disease of the prostate, it will be preferable to perform the common lithotomy, and afterwards with the finger in the rectum to raise the stone above the level of the prostate gland, so that it may be grasped by the forceps.

But we must next suppose it possible that the

operation may be performed, and the stone only then for the first time discovered to be sacculated; how are we to proceed? It must be confessed that, it is a difficult, and most embarrassing situation. We must endeavour with the blunt hook, engaged in the margin of the sac, to pull down the part of the bladder within reach, and by using the small forceps to separate the margin of the sac, so as to obtain a grasp of the stone, and in doing this, the operation will be greatly assisted by having the finger in ano; for when the stone and sac are brought down, the finger in ano will keep them there, opposite to the incision. This failing, the last thing to be done is, the incision of the margin of the sac, and the extraction of the stone by the hook or forceps.

OF THE ADHESION OF THE STONE TO THE BLADDER.

These preparations lead us to reflect on another singular circumstance, viz. the adhesion of the calculus to the inside of the bladder; this may take place in two ways---1, by the formation of calculous matter in the interstices, and on the surface of fungous tumour: 2, by the intermedium of coagulable lymph, which while it adheres to the surface of the bladder, entangles the rough surface of the stone, and thus attaches it to the bladder.

In neither case is it the adhesion of the living surface to the dead stone; and in both instances

the stone may be torn from the bladder in the operation of lithotomy. In doing this, it may happen that the bladder is brought down and inverted, and the stone separated like the stone of a ripe peach. This has been done without any bad consequence ensuing. But when a surgeon pulls hard, having the stone in the grasp of his forceps, and calls that it is adhering! this is lamentable ignorance; for although the stone adheres, the adhesion is not so firm as to bear this exertion; the hinderance is in the size of the stone, or arises from the incision being small, or too high.

*** *See further of the operation of Lithotomy in a future part of the work.*

REPORT

OF FRACTURES OF THE SKULL, AND OF THE COUNTERFISSURE: BEING OBSERVATIONS ON THE FORM AND JOININGS OF THE BONES OF THE CRANIUM; INTRODUCTORY TO THE CASES OF INJURIES OF THE HEAD, TO BE DELIVERED IN FUTURE REPORTS.

I WAS led to deliver the substance of this paper in a Clinical Lecture on some cases of counterfissure, which occurred in the beginning of the season. In making a selection for the present number, this subject seemed particularly deserving attention. I have, therefore, added some further illustrations, but have preserved the form of a lecture; still craving my reader's indulgence; for I have had now, as on many occasions, to balance what was due to him on the one hand, and to the importance of the subject on the other. I must either write it in intervals of business, and lay myself open to the accusation of carelessness, or leave subjects which deserve and require illustration unattempted. I think that I shall be able to shew, that we have been very negligent of those principles which are to be drawn from the structure of the bones of the head, and from experiments upon them. How incuriously the anatomist travels over the points of demonstration of the bones of the head, is matter of wonder to every one; yet the subject is surely capable of exciting a lively interest. The experiments to which I

allude, are not of a very pleasing nature; yet are they, I am sure, justified in the importance of the results.

It is a common fault with us to consider the form of the fractures of the skull, and the nature and degree of the injury as accidental circumstances. Although it be an accident, or the chances of life, which bring a man to be the subject of these discussions, yet the nature and extent of the injury to the bone, the membranes, and the brain, may be inferred from the knowledge of the size, weight, and velocity of the impelled body. Does not this fact impose upon you a very serious subject of study?

But, before entering on this discussion, will you permit me to give you a general advice? When you first visit a patient, who has suffered a dislocation or fracture, do not begin with seizing on the limb as if you feared some one might be beforehand with you: but sit down beside him, and know all the circumstances attending the accident before you touch him; and this not for the purpose of condolence, far less for effect, but to enable you to make your examination like a skilful surgeon. As by such inquiries the question of fracture or dislocation will be determined by the knowledge of circumstances, even before you touch the limb; so in fractures of the skull, a like advantage may be obtained by learning the manner of the accident before the lint be removed, or any sort of examination made. Thus it is important to know whether

the patient was struck, or fell from a height; if he fell on a level stone, or the hard surface of the trodden earth, or on a corner;—if he were struck with a stone, a brick-bat, or a bludgeon. Having obtained a knowledge of the size, weight, and momentum of the body, with which the wound was inflicted, we are enabled to form an estimate of the fracture to be met with; which of itself would be of less consequence, since it can be known by inspection, did not the same investigation lead us also to the knowledge of the extent and nature of the injury within, and which we can not ascertain by inspection.

The varieties of fractures of the skull and the nature of the forces producing them have been familiar to me since the time I was engaged in preparing for lecture, and long before it was my business to explain them. If it were desired that there should be a fissure of the skull, the body was permitted to fall with the head upon the stone pavement. If it was required to exhibit a stellated fracture, to demonstrate the uses of the trepan, and the use of levers in raising the loose pieces, then the skull was smartly struck with a heavy weapon. If a comminuted fracture were required, then a bullet slung to the end of a stick would effect it, exhibiting a depression, consisting of many loose pieces of bone which might be picked away. If it were required to prove the manner in which the dura mater is shaken from the inside of the

skull, it only required that the head should be struck with a mallet. If it were desired to exhibit the brittleness of the tabula vitrea, and the comparative softness of the outer table, I impelled a blunt point against the skull, so as to indent it and make a pit on its surface, and then the loose table would exhibit large scales of sharp bone broken off and thrust upon the dura mater.

There is no excuse for such rudeness, but in the very important results which may be drawn from them as experiments. For in this manner, by knowing the instrument with which the wound has been inflicted, we know much of the nature of the wound. But further, we must take into account the form and thickness of the skull, since it is possible, with the same instrument impelled with the same force to make either a fissure or a fracture, for if the blow be on the temporal bone, there will be fracture with depression, and if it be inflicted on the stronger vault of the vertex, or on the occipital bone, there will be an extensive fissure without depression.

Further to exhibit the usefulness of such experimental inquiring into the subject of injuries of the head, I shall here enter into the examination of the source of the extravasated blood, which we find under the skull in very severe injuries of the head, of which you have lately seen examples.

Certainly no circumstance can better shew the necessity of a close examination of men's opinions,

than the advice given by Mr. Abernethy in the section* treating of extravasation of blood upon the dura mater, and it will appear no doubt remarkable that he should display on many occasions such vigour of intellect and close reasoning, which have been attended with great improvements, and on this take so much for granted, and convey an advice so full of danger.

He details three cases of fracture of the skull where the depressed part of the bone was over the middle artery of the dura mater, by which he supposes that artery was lacerated. The consequence of this, according to this author, was an extravasation of blood which tore up the dura mater, the coagulum being not less in the first instance than an inch and a half in thickness, and six or seven inches in circumference. After the detail of these cases, Mr. Abernethy quotes others where the artery of the dura mater was ruptured, without either fracture or depression. The practical conclusion drawn from these cases is to this effect: they show, he says, that a fracture of the skull is not likely to be followed by an equal degree of extravasation in every part, as the vessels connecting the dura mater to the cranium are in some parts of that membrane of a small size. If these be accidentally ruptured a slight hæmorrhage ensues, which soon stops, and only a thin stratum of blood

* Surgical Observations on Injuries of the Head.

is found when the bone is removed. But if the fracture happen in the tract of the principal artery of the dura mater: if the trunk or even a considerable branch of that vessel be torn, the hæmorrhage will be profuse, and the operation of the trephine become immediately necessary to preserve the life of the patient.

There is a mistake running through the whole of this statement, I might say it is extraordinary that any one who had ever raised the skull-cap in dissection, and felt the strength of the universal adhesions of the dura mater to the lower surface of the bone, could for an instant believe, that the *arteria meningea media* has power of throwing out its blood, to the effect of tearing up these adhesions from the entire half of the cranium! Indeed he who has described this extraordinary phenomenon has thought it necessary to suggest another explanation equally devoid of proof, that an artery under compression exerts an extraordinary power, which we are destined never to witness, since it is supposed to cease, the instant the vessel is uncovered.

I shall contrast with these cases, and the deductions drawn from them, an experiment which has been often made in our rooms. Strike the skull of the subject with a heavy mallet: on dissecting, you find the dura mater to be shaken from the skull, at the part struck. Repeat the experiment on another subject, and inject the head minutely with size injection, and you will find a *clot*

of the injection lying betwixt the skull and the dura mater, at the part struck, and having an exact resemblance to the coagulum found after violent blows on the head.

I imagine this is conclusive: it shows that the blow is capable of separating the membrane from the bone; it shows that the membrane being separated by the shock, the extravasation of blood is a consequence, and not the cause of the separation. It proves also that the advice is wrong which would hurry the young surgeon to trepan the skull immediately, to preserve the life of the patient, and to prevent the hæmorrage from being profuse: for this idea is given on the supposition that the artery is slowly separating the membrane from the bone by the force of arterial pulsation.

But it remains to be explained how the extravasation of blood is greater on the sides of the skull than at the other parts, and the reason of this will come out in the explanation of the phenomenon of the counterfissure.

CASE OF COUNTERFISSURE.

April 16.—This morning a man was brought into the hospital in a state of insensibility, from an injury of the head. His fellow-workmen who brought him in, say, that he was below in the tunnel, making for the Regent's Park, when the bucket slipped from the hook, and ran down with

great velocity fifty feet, and struck him on the head. I have taken pains to learn whether the bucket fell loose from the windlass, or only rapidly uncoiled the rope by its weight; and I find that the rope was uncoiled.

He is quite insensible, only that when we feel his head he winces and writhes in bed. His pulse is 56; his breathing slow, and with stertor; his pupils are contracted: but we are now informed that when he was brought in, the pupils were dilated, and that they have gradually become contracted. There is a very considerable tumefaction of the scalp behind the ear, and above the transverse line of the occipital bone.

We further remark, that at short intervals he draws a deep sigh, and at the same time a tremor or shudder passes over his frame; after which the usual respiration is resumed; but it is attended with a snort in the inspiration. The pulse is irregular; there is a hurry, after which it resumes its regular pulsations.

The scalp was opened where it was tumefied; the natural irregularities of the bone for a moment appeared, like depression, but there was in fact no fissure to be observed.

After the incision of the scalp six ounces of blood were received into the cup from the occipital artery, and thirty ounces taken from the arm. The pulse increased in quickness after the last bleeding.

Afternoon.—Pulse 90, and weak. There is more heat of skin. In the evening there was more stertor. On the second day he died.

Dissection.

Coagulated blood lay under the skull, and extended over all the base of the brain. There was no fissure in the skull-cap, but a rent was discovered in the base of the skull. It began by the side of the petrous bone of one side, and extended round the occipital bone behind the foramen magnum to the petrous portion of the temporal bone of the opposite side.

The blow had been received on the strongest part of the skull, in the convexity of the occipital bone; the fissure was in the weakest part. It was a pure instance of the counterfissure.

CASE OF COUNTERFISSURE, FROM A FALL, THE CROWN OF THE HEAD HAVING STRUCK THE GROUND.

A young man was sitting on a parapet wall of a garden. Betwixt the wall and the house there was an area of four or five feet in depth. Some girls, in play, pushed him, and he fell backwards, and fell upon his head. He was brought into the hospital stunned, but recovered as from a case of slight concussion; and by the usual means, rather by way of precaution than of necessity, he apparently got well. This young man had been dismissed, and

had gone into the Board-room, to return thanks. He returned into the ward, and while speaking to the nurse, and turning round to take up his bundle, he suddenly fell down, and died.

On *dissection*, the cause of this sudden and unexpected death appeared very evident. The margin of the great foramen of the occipital bone was fractured, and it appeared that on suddenly turning the head, the condyle was displaced, and the loose bone brought to press and nip the medulla oblongata. As this pressure was at the root of the eighth pair of nerves, and above the origin of the Phrenic nerves, it of course cut off all communication betwixt the lungs and muscles of respiration, and the patient was as suddenly deprived of motion and respiration as if he had been pithed. You owe this statement to Mr. Joberns.

EXTRAVASATION OF BLOOD FROM THE ELEVATION OF THE SKULL AT THE POINT OPPOSITE TO THAT STRUCK.

Friday, Sept. 27.—Mary Brown, aged 77, was pushed down by a young fellow who carried a truss of hay. The fore part of her head was struck against an iron bar. She was soon after brought into the hospital in a state of insensibility. There was a wound extending obliquely over the right orbit, three inches in length. The bone was bare, but no fissure could be discovered. She was bled: during the night she became in a slight degree delirious.

28. The eye is closed by the tumefaction, and the integuments are much discoloured. The pupil of the left eye is natural. She does not answer when spoken to, but appears conscious of the disturbance. Pulse 100, and strong. The bowels have been moved: leeches are applied to the temple.

29. She was bled in the arm yesterday. All night she has been very restless, so that it required force to keep her in bed. Pulse 132. She has been vomiting a black matter, of the consistence of jelly.

30. The pulse still remains strong, although she has lost altogether fifty ounces of blood. Hemiplegia of the right side has taken place, and the muscles of the left side of the face are contracted. She is more restless, not more sensible.

Oct. 1. The wound is suppurating: it is dressed with simple dressing and a poultice. There is more sensibility to-day than there has been hitherto.

2. The pulse is weaker: she is again comatose —died in the evening.

On examination, an ounce and a half of blood was found under the skull on the left side of the occipital bone, and at the extremity of a line drawn diagonally across the head from the wound of the forehead. There was effusion of serum betwixt the membranes of the brain.

Note attached to the foregoing Case.

The old woman who died in the beginning of the month, with the fracture of the skull, exhibited another effect of the contre-coup. There was no disturbance or inflammation in the membranes, or the brain immediately under the part of the skull injured; but the opposite hemisphere of the cerebrum was much inflamed, and had coagulable lymph thrown out upon its surface.

ANOTHER EXAMPLE OF THE BRAIN INJURED AT THE EXTREME PART OPPOSITE TO THE BLOW.

On the 24th of January, of this year, the trephine was employed in circumstances to be accounted for, only on the principle of counterfissure. A man fell from a height, and injured the right parietal bone near the coronal suture. He recovered from the effects of concussion, but after an interval, he was attacked with rigors, became quite insensible, and lay with stertorous breathing and total relaxation of one side. This implied the formation of matter, and the bone was exposed and examined; it was found bare, the pericranium having separated from its surface. The trephine was applied, but no matter was found under the bone; next day the patient died.

On dissection, the left posterior lobe of the cerebrum was found inflamed, and covered with purulent matter.

Now you may say, that within your own experience you have seen examples of counterfissure. It is a subject which ought not to be taken up as a speculative question, for it is of direct practical use. I believe you understand my motives better than to believe that I would call you together, merely to witness a thing curious or rare. The counterfissure is not an accident, but comes necessarily from the form of the head, and the nature of the force employed, and *in every injury of the head, there must be more or less of that reflected impulse*, which, though it does not actually fracture the skull, yet it shakes, and injures the finer texture of the brain. It is from the influence of this reverberation, or rather circuitous repercussion on the substance of the brain, prevailing in some degree in all cases, that should induce you to make the principle an object of study; since that which has sometimes so remarkable an effect, even on the bone, cannot fail to have a considerable influence in every case upon the brain.

The best dissertation on this subject, is in Haller's collection of theses; and others will be found in the prize memoirs, presented to the Royal Academy of Surgery of France. I think it is in the first of these that we find the following illustration of this subject. Suspend a hoop horizontally by cords, so that certain balls also suspended by threads, touch the hoop on all sides, (see plate XIV. fig. 1.) Suppose that we be prepared to strike a certain point of the circle A, let a ball B, be suspended on

the point opposite, but touching the inside of the circle, let others be placed laterally on the hoop C.C., but on its outside. The consequence of striking the hoop smartly on the point A, will be to drive these balls in different directions, (viz. in the direction of the dotted lines,) for the ball which is suspended on the inside of the hoop, and at the part diametrically opposite to the part struck, will be driven inward, while those suspended on the outside of the hoop, and lateral to the direction of the blow, will be sent outwards.

This is a fine illustration of what must take place, when a hollow elastic sphere is struck. It instantly assumes the spheroid, as represented by the dotted line, for the part struck is beat in, the sides are spread out of necessity, and the point opposite to that struck, is flattened as a necessary consequence of the lateral parts being thrown out. Being elastic, the spheroid will become a sphere, but the recoil will not permit the particles of the body to rest here, but the parts which were rendered more convex, will become less convex; and those which were flattened will become prominent, and thus they will alternate while the motion occasioned by the blow continues. This is exemplified in a bell, which has been struck, and which, while it continues to sound, undulates, changing its figure incessantly from the ellipsis, whose longest diameter is first transverse to the direction of the blow, and then conformable to it, and thus alternating. It is not therefore surprising that a bell being

struck, should sometimes crack in the part opposite, for if the part opposite to that struck should be the weakest of the circle, we see how the vibration reaches it, and in a manner to be very little diminished in degree of force.

Much in the same way does the blow upon the skull act, in producing counterfissure. Thus when a man falls backward on the prominence of the occiput, a tumefaction is observed in both temples, and on exposing the bone, there is a fissure there, for then the sides of the skull are propelled outwards, as the circle, Plate XIV. fig. 1. is forced out at the sides C.C. when struck at the point A.—Again, when a man is struck with a heavy body on the sagittal suture, the temporal processes are spread out and fractured. For example, when the mallet in fig. 4. strikes down the superior margin of the parietal bone, the lower margin starts out as is represented by the dotted line.

And now it is plain, why the counterfissure of the skull is of so rare occurrence; for the percussion would reach round the circle of the cranium, and unite its influence on the point opposite; were it not for the weakness of the intervening parts, which break, and thereby save the part diametrically opposite. The form and inequalities of the human cranium must be taken into consideration, or even this principle of counterfissure, obvious as it is, will mislead us.

An idle notion is entertained that the skull is moulded to the brain, by which I know not what

absurd doctrines are afloat; when, as is most obvious, upon attentive inspection, the skull has a relation to external circumstances; and the brain is compressed, and forced to accommodate to the form of strength which is bestowed upon the skull. If we look attentively to the parts of the head which are exposed, and to the sides which are naturally protected, and to the position of the eyes, we shall be convinced that the convex form and the thicker substance, (still further strengthened by ridges,) are as a protection to such parts as are most exposed: as the occiput, the prominence of the parietal bones, and the eminences of the frontal bone; while the temples are flat, and the eyes relatively prominent; and thus the sphere of vision is thereby extended, which we must consider as the end or object of this form of the temple.

And here I am tempted to say a few words on the form and sutures of the skull, because students are too often hardened against the most evident truths deducible from the anatomy, shutting themselves out from the most agreeable and positive proofs of design in the structure of the body, and of infinite perfection in the adaptation of the parts to each other.

The joinings of the bones of the head vary according to the strength of the bone and the necessity for resistance. In the weaker and thinner bones, the surfaces are in contact merely: instead of the suture, there is the mere line of contact; but in the outer bones of the cranium, proportioned

to their strength, is their union by deep sutures or indentation; and in the horned quadrupeds, in proportion to the strength of the bones necessary to sustain the horns, is the fine and exact texture of the suture, to hold these strong bones in union. We have the best example of design in the form of the junction of the bones in the temple; for as I shall presently shew that the angles of the parietal bones which lie in the temple are most apt to be spurred out and rent, so here it is we see a particular mechanism obviously intended to restrain the lower part of the parietal bones from being started. It is commonly stated that the squamous suture is different from the others, in consequence of the action of the temporal muscle on the edges of the bone, which is in fact no reason at all, and does not by any means explain why the upper edge of the temporal bone is projected over the lower edge of the parietal.

The lower or temporal angle of the parietal bone is locked into the embrace of the temporal bone, in order to bind the bones of the cranium together, and that it may be held firm, and be restrained from rising and separating from the dura mater, which it would do, on every violence done to the cranium, were it not for this mechanism. Indeed, in severe injuries to the upper part of the skull, so great is the liability of this lateral part of the cranium to yield, (proceeding from the form of the bones), that fracture will take place, and extravasation will be found under the parietal bone, while the temporal bone

still holds the lower angle of that bone firm in its place.

I see that you attend with interest to this subject, and as it is worthy of your most serious study, I shall, with the assistance of the chalk and board, explain some things which have been overlooked, and which, I hope, will conduce to raise in your minds a conviction of the adaptation of parts, and which may carry you beyond the present subject.

The Subject continued.—Of the Form and Joinings of the Skull, as illustrative of the Forces operating upon it, and as proving Design in what has been attributed to accidental Circumstances.

It argues a low conception of the subject we are upon, when authors attribute the formation of the sutures of the skull to accident, or to the manner in which the bone is ossified, and this because they see in one part the perfect suture, and in another the simple line of union. This very circumstance is what will prove design, and an obvious regard to the pressure to be sustained, by each bone of the cranium. The sphenoid bone is a very essential part of the *carpentry* of the skull, and by it the lateral walls are joined as by the *tie beam* of the centering of an arch: for the obliquity of the two rafters, as A. B. fig. 3. plate XIV. bearing the weight C. will occasion what is termed a horizontal thrust, to counteract which, an essential part of the structure is the tie beam D. The

use of this tie beam is to prevent the weight of the roof from pushing out the walls.—When we turn our eye to fig. 4, which represents the parietal bones, we observe that when there is pressure on the vertex, the lower part of the parietal bone, or the temporal angle, is liable to a horizontal thrust, or in other words, to yield and to be thrust outward, which is represented by the dotted line. But by the transverse position of the sphenoid bone, and the strong embrace of its alæ upon the edge of the parietal bones, we see a provision for restraining the temporal margin of these bones. In carpentry the end of the rafter is united by tenon and mortise, fig. 2, or more securely by the form of the joining, fig. 3: indeed we may illustrate it by a thing more familiar, viz. the cocking or cogging of the beams to the wall plate of a house. For a wall plate is a piece of wood built into a wall, to which the transverse beam is dovetailed and secured, so as to prevent the wall from shooting. Now, the form of the union of the lower part of the parietal with the temporal bone and with the sphenoid, is of this nature; for I may add, as the anterior angle of the parietal bone and the lateral part of the frontal bone, are held embraced by the sphenoid bone, so is the posterior part of the parietal held by the temporal bone. The mastoidean angle of the parietal and the mastoidean angle of the temporal bone are fixed together by the *tenon and mortise*, as in fig. 2; for in the specimen in my hands, a projecting point of the temporal bone is

received into a mortise or socket of the angle of the parietal bone. The great strength, and the broad and general connexions of the temporal bone, make it answer the same in effect with the sphenoid bone, although it does not so accurately represent the transverse beam which we find in the centering of an arch.

In the manner in which the parietal bone sits down upon the temporal bone, taking advantage of the resemblance suggested by the word *paries* or *wall*, there is a remarkable similarity to the groining, which is the foundation of a wall in masonry. For as a high wall cannot stand on a foundation no broader than itself, certain offsets are constructed, which, by enlarging the diameter of the masonry at the foundation, give it a base proportioned to its height, and consequently to its weight. In this manner, the wide and universal bearing of the pars petrosa of the temporal bone, is able to sustain the arch of the head, and the pressure to which this arch is sometimes exposed, and the zygoma, petrous and mastoid processes, are not unlike the groinings or arches built under a wall to afford a secure foundation. Again, the temporal bones are like the abutments of the arch of the parietal bones; and it is ascertained that a curved rib or bar of cast iron will, with abutments, bear double the weight that they will do without it. From this it is evident, that if a boy stand upon his head, the temporal bones sustaining the extremities of the arch of the parietal bones (now inverted) will be ca-

pable of sustaining the whole weight of the body; but, if the abutments of the temples were removed, the arch of the parietal bone would sink, the sagittal suture would sink in, and the temporal processes be spurred out. The building of an arch will furnish us with another pertinent example, illustrating the form of the side bones of the cranium, and by the care to supply that in the masonry of the bridge, which must necessarily be defective in the connexions of the skull, we shall be led to observe the weaker parts of the bones. In masonry, pressure or gravitation must be substituted for the cohesiveness of the material in carpentry. In the Fig. 5. the arch A supports the great weight of the material of which it is constructed, and the superincumbent weight to which the bridge is subject, by a horizontal pressure upon the spring of the arch, and consequently against the pier. We ascertain this by the ingenuity displayed to counteract it, for to support the spring of the great arch at B, a smaller inverted arch C is interposed betwixt the point sustaining the horizontal pressure, and the next arch, which bearing in the contrary direction, opposes and supports the first one, and so of the others, until they are finally opposed, and supported by the abutments on the banks from which the bridge is extended. In the gothic arch, weight is more demonstrably employed to resist the horizontal pressure of the arch: thus they would raise the arch at A, to diminish the shove on the spring of the arch at D, and build the

superstructure E, which by mere gravitation would sustain the point D, and bear up the centre of the arch. Now, taking the united parietal bones, Fig. 4. being in effect a vault or arch, and supposing that they are struck by a heavy body, as by a mallet here represented, we cannot be blind to the consequences: for the lower angle is the spring of the arch, and it must be thrust out like the arch of the bridge, where the weight and stability of the pier has not been duly calculated to the weight of the material and the form of the arch. And hence we see the reason why a man falling upon his head, or struck as with a mallet on the vertex, does not suffer at the part struck, but he has a fissure in the temporal angle of the parietal bone. Further, we perceive more distinctly the reason of the inferior edge of the parietal bones, being locked within the embrace of the temporal and sphenoid bones; for if this were not the case, on slighter injuries, the connexions of the bone would be burst up, and the interior membrane separated from the bones at this lateral part, a circumstance which very often happens, but must have still more frequently occurred, had there not been this restraint upon the temporal angle of the bone.

The principle of arches will illustrate some particulars in the shape of the individual bones of the cranium, as well as the general form. If we hold the skull before us, looking to the occiput (the skull being above the level of the eye), we shall see

that the posterior part of the parietal bones forms a flat or elliptical arch. As the eye is raised so that the anterior part of the convexity of the skull comes gradually into view, we shall see the arch of the circle rise, so that from the segment of a larger circle, it becomes the arch of a smaller circle, and when the convexity is formed by the upper part of the frontal bone, the centre of the arch is elevated, forming that which I think is called the catenarian arch. But it is remarkable that where the utmost transverse convexity of the skull is, there we shall find the line perpendicular to the spine, if we make our observation when a man carries a heavy load upon his head.

Thus, if he hold the head in the position, A A. Fig. 6. he will have some difficulty in supporting the weight, by the exertion of the posterior muscles of the neck. To ease them, and to sustain the weight perpendicular to the condyles of the occipital bone, he will throw the weight more and more forward, and the head consequently more and more backward, until the outline of the skull assumes the position B B., and the weight is then sustained on the utmost convexity of the frontal bone. It is obvious, that by this elevation the arch of the head is strengthened; and that there is, in this strengthening of that part of the vault of the head, which is directly in the line of gravity, a provision for sustaining pressure: this will be made still more obvious by separating the bones, for then it will be seen, that the thickness of the frontal bone, and

the corresponding part of the parietal bones, is increased at the centre of the arch, and where the convexity is greatest. When the frontal bone is separated, let us hold it before us, and we shall again see an example of the groinings for the foundation of an arch: for the frontal bone is supported on the arches of the orbits, and what is deficient in the centre of the roof of the orbit is compensated by the temporal ridges, by the orbitary arch, and the extension of the walls in the formation of the frontal sinuses. Further, we must admire the manner in which the form and thickness of the bones of the cranium are apportioned to the injuries they have to sustain. Thus we see the frontal eminences are well adapted to sustain the pressure and blows in front. The abrupt elevation of the parietal bone at the utmost lateral convexity of the head, is in the same manner calculated to sustain the pressure of bodies in that more exposed point; and there is no one who can remain blind to the provision to sustain the occiput, which is the part of the head most exposed to severe injuries by our slipping backwards: since it is not protected as the sides of the head are by the shoulders, nor by the ready guard of the arms. The *kingpost* or central post, the *struts* or lateral beams of carpentry, are not more obviously intended to support a roof, than the arched ridges on the inside of the occipital bone are designed to support the tuberosity against the accidents to which it stands exposed. There is still a better illustration, I mean

the formation of a groin. For the groins in masonry are the mutual intersections of semicylinders or arches, and the regular groin is where the intersecting arches are of similar diameter and height, which is a description of the internal crucial arches of the occipital bone. But it is in the form of the junction of the bones of the cranium to which our attention is to be drawn, as showing a minuteness of attention to the finish, well corresponding with the great plan of the structure. By the sutures, every bone is locked, the posterior part of the temporal bone is received within the parietal bone, the anterior part, on the contrary, embraces the parietal bone. The temporal alæ of the sphenoid bone embrace the parietal bone and frontal bone; but are in turn embraced by the temporal bone. The frontal bone embraces the centre of the sphenoid bone, but the lateral parts of the frontal bone are embraced by the extended wings of the sphenoid bone. Again, in the connexion of the frontal and parietal bones in the coronal suture, we see the same provision: the parietal bones overlap and embrace the lower part of the frontal bone, but they are in turn embraced by the frontal bone at the upper part, and near the sagittal suture. I may say, here is evident contrivance, for the word cannot degrade the subject; it serves only to prove to us that we can be excited to wonder, and to an indistinct comprehension of the perfection of the Divine architect, when the resemblance of

things are most obvious, and like our own little contrivances.

The sutures themselves declare that nothing is chance. The bones are dove-tailed together, or united by the tenon and mortise; and we must remark, this firm junction is made on the outside, for although the upper or lower margin of the bone be outermost according as the weight bears, still the indentation is always formed of the outer table of the bone. And the reason is obvious; the more brittle internal table is unfit for this form of union. The teeth, if formed of the tabula vitrea, would fracture and splinter up. The inner table is like the material of the mason, unfit for these firm scarfings by keys, dovetails, and wedges. The carpenter, in the formation of keys and tables of beams which he intends to unite is most particular to observe the direction and tenacity of the fibres of the wood in which he works; otherwise the portions of the beam intersected would be fractured off, and give no support. May we not put it thus: that if he had a material to work upon, one side of which possessed the toughness of timber, and the other was short in its fibres, and brittle, would he not frame the joinings out of the former, and not of the latter? Such I apprehend to be the reason, why, on looking to the interior part of the skull, we observe only lines of contact, and on the outside the indented suture, where we may see an example of every contrivance of the joiner.

CONCLUSION.

These cases and remarks will have convinced you that to the right understanding of the injuries of the head, it is necessary to consider both the form of the skull, and the mechanical principle as connected with the building of the arch.

The young surgeon will not take the varieties of capillary fissure, fracture, and fracture with depression and comminuted fracture as things accidental; but as he knows that he can at any time (by adapting the instrument and the force) make them on the dead body; so may he calculate the effects of injuries on the living body, since the principles cannot be very different in the living and the dead.

He will not attribute some unknown and extraordinary force to the meningeal artery, supposing it capable of tearing off the skull-cap from the dura mater! but seeing that by a blow he can at any time shake the dura mater from the skull in the dead subject, he will understand how after a blow on the head, the coagulum of blood is poured out into the interstice betwixt the membrane and the bone.

He will not be at a loss after the illustrations we have had, to assign the reason why the dura mater is more shaken from the bone on the side of the head, nor why the temporal angle of the parietal bone is so often fractured, when the blow is upon the vertex.

And now seeing that the effect of a blow upon

the head is not to split the skull by a force acting in a diverging direction, but in circular vibrations around the cranium, he will know that fissures always make their course towards the weaker part in the temple. If he require to follow them it will be in that direction.

If he is to use the trephine for blood extravasated under the skull, he will not apply the instrument at random on the convexities of the cranium, but on the flat part of the temple, and that, not because the artery is there to tear up the dura mater with extreme force, but because he knows that the thinness and flatness of the bone here, will make it more ready to start from the surface of the dura mater, and if it have separated at any part, the separation must be greatest here.

As to the matter of counterfissure, understanding the principle, he will comprehend how a remote and weaker part of the cranium is rent, when a thicker and more convex part is struck. He will not be surprised, that when the stronger occipital bone is struck, the temples will be spurred out, or how, these resisting, the base may be fractured. He will perceive that this is not a thing merely to be wondered at, but that, arising necessarily from the form of the skull, it must have more or less influence in every case; and he sees here the fact exemplified, that although the reflected force be not so great as to burst the bone asunder, yet it injures the fine texture of the brain; in one instance it throws out blood upon its surface; in

another, it separates the dura mater, or in a third, it covers the surface of the brain with purulent matter, and that, at the part diametrically opposite to the injury of the skull.

In completing the first Volume of these Observations, I am not less impressed with the usefulness of the undertaking, nor does my resolution fail to prosecute it. It will be acknowledged that these are not essays drawn from my papers, but observations suggested by the occurrences of practice. To give them any tolerable form, for the eye of the public has been in the midst of other occupations, a great oppression to me. Although I stand pledged to the completion of the work, I find I cannot promise either the same regularity or frequency of publication in future. If this departure from the original plan of publication should occasion disappointment, I trust it will be counterbalanced by the Reports being richer in cases and pathological inquiries, and more carefully composed.

END OF VOL. I.

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A
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B
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D
E
G
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Fig. 1.

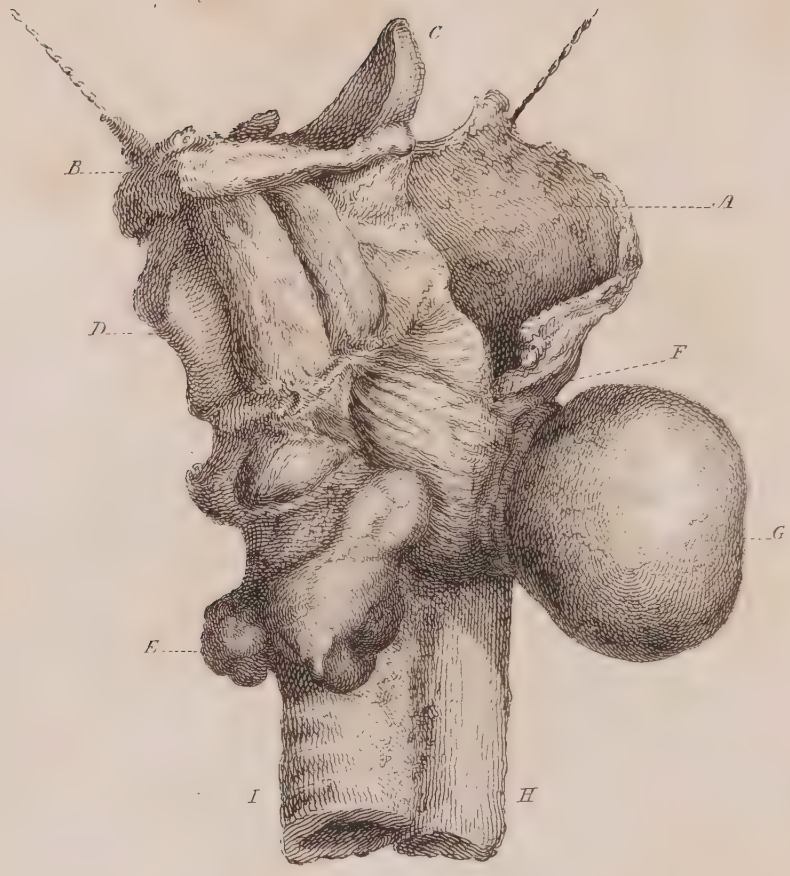


Fig. 2.



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EXPLANATION

OF THE

PLATES.

PLATE I.

THIS Figure represents a Back View of the Pharynx and Œsophagus, disordered by a Scirrhous thickening and Ulceration.

A. The Velum Pendulum Palati & Uvula.
B. B. The Tonsils much enlarged and tuberculated.
C. The Glottis and Epiglottis rough with Ulceration.
D. The Pharynx tuberculated by the Disease of its glandular Structure.
E. A Stricture formed in the inner Membrane of the Œsophagus.
F. The Œsophagus below the Stricture.
G. The Thyroid Gland much enlarged.

PLATE II.

This Figure is presented as an Example of a very common Appearance of those Parts.

FIG. 1. The Larynx and Pharynx. [*See Page* 67.]

A. Pharynx.
B. Os Hyoides.
C. Epiglottis.

D. Thyroid Cartilage.
E. Thyroid Gland.
F. Fibres of the Constrictor Pharyngis.
G. A Preternatural Bag, formed by the inner Membrane of the Pharynx, being thrust betwixt the Muscular Fibres.
H. Œsophagus.
I. Trachea.

FIG. 2. The Œsophagus which has suffered Stricture in consequence of swallowing Soap Lees.

A. Œsophagus above the Stricture.
B. The Stricture.
C. The Membrane of the Œsophagus drawn into Folds.
D. The lower Part of the Stricture, which is distinctly formed by a Layer of coagulable Lymph.
E. Œsophagus below the Stricture.

PLATE IV.

FIG. 1. A Stricture of the Œsophagus. See page 77.

A. Epiglottis.
B. B. False Glottis.
C. C. The Pharynx in Outline.
D. The Stricture into which a Hog's Bristle is introduced.
E. The Bristle.
F. The Œsophagus below the Stricture.
G. The Trachea.

FIG. 2. Refers to a Paper of Mr. Shaw's not published: it shows the Beginning of the Disease of the Prostate treated of by Sir Everard Home.



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Plate IV.

Fig. 1.



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Fig. 2.

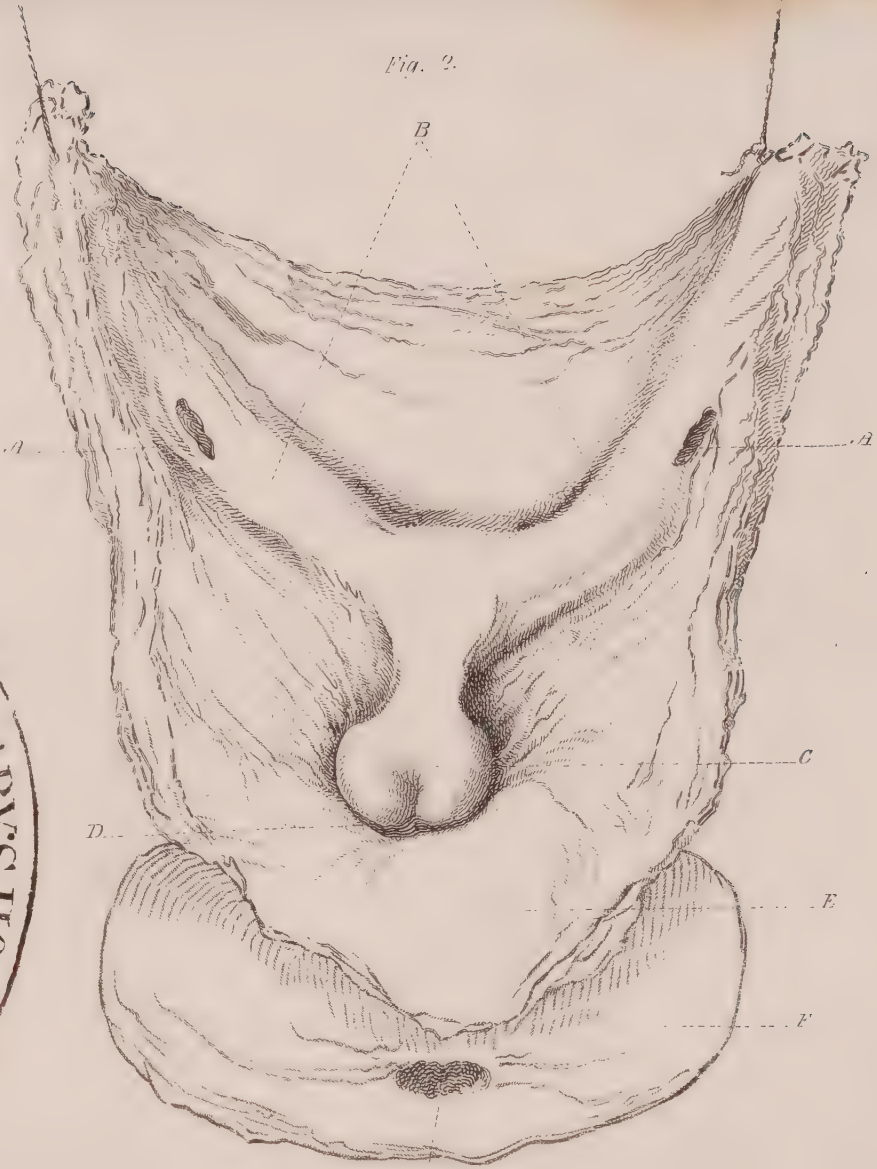


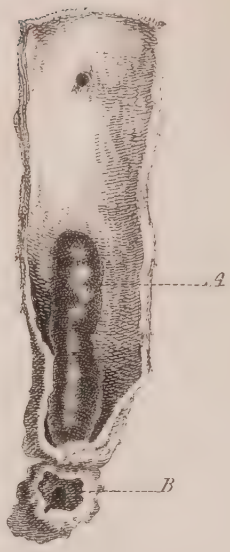
Fig. 1.



Fig. 2.



Fig. 3.



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Fig. 4.

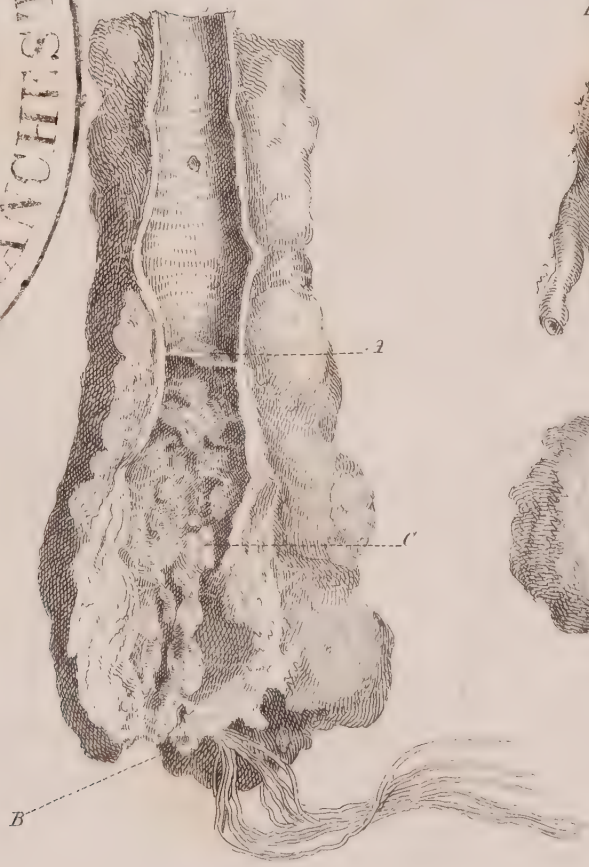
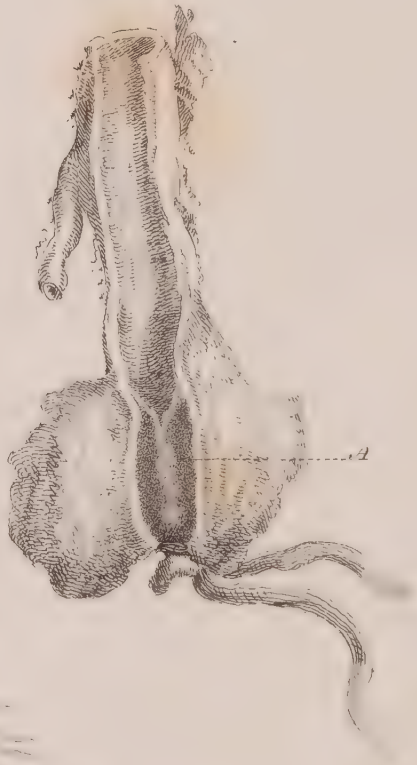


Fig. 5.



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EXPLANATION

OF THE

PLATES.

FIGURE 2, PLATE IV.

In the First Number.

This Figure represents the Prostate Gland, with Part of the Bladder seen from within.

A. A. Openings of the Ureters.
B. Muscles of the Ureters, very strong.
C. Insertion of the Muscles of the Ureters into the Prostate, the Part into which they are inserted forms a projecting Tumour, hitherto considered to be the third Lobe.
D. Opening of the Urethra closed by the projecting Portion of the Gland.
E. Part of the Coat of the Bladder thrown down on the Prostate.
F. Prostate slightly enlarged.
G. Beginning of the Membranous Part of the Urethra.

The back View of the Prostate is not given, but in the Preparation the Portion called Third Lobe, may be seen projecting downward, and distinct from the Valvular Tumour, commencing at C.

PLATE V.

This Plate illustrates the Dissertation on the Ligature of Arteries.

Fig. 1. The Femoral Artery dissected from the Stump, after Amputation.

A. A very small Clot.
B. A considerable Branch going off very near the Place of the Ligature, and which, by bringing down the Stream of Blood, has prevented the Formation of the Clot. We see here by what a precarious Tenure the Secondary Hæmorrhage is restrained. Such a Circumstance has produced fatal, because unexpected and sudden, Hæmorrhage.

Fig. 2. Represents the Effects of an Experiment—A Ligature was thrown loosely around the Carotid Artery of an Ass; the Effect was to intercept the Course of the Blood.

A. The Ligature encircling the Artery, but not drawn; but only in Contact with the Outer Coat.
B. B. The Clot formed as a Consequence of the Ligature as a foreign Body irritating the Artery.

Fig. 3. The Artery of a Stump.

A. The Clot.
B. The Hole from which the Ligature was withdrawn. This Preparation shows, that in a healthy Stump the End of the Artery below the Ligature remains; that the Ligature comes away without bringing a Portion of the Coats with it.

Fig. 4. The Artery of a Stump.

A. The Remains of the Clot.
B. The Ligature remaining three Weeks after the Operation.
C. The Coats of the Artery fast degenerating into common cellular Tissue. This Preparation shows the Necessity of twisting the Ligature, to prevent the Threads being entangled with the Granulation; and that, long after the Artery is closed, the Ligature will retain its Connexions to the Granulations, and seem still to be attached to the Coats.

Fig. 5. The Section of the Artery of a Stump.

A. The Clot divided, so as to show its Adhesion to the Sides of the Vessel.

PLATE VI.

This Sketch was taken from a Frenchman wounded at Waterloo; the Head of the Humerus and the Acromion Scapulæ were fractured by a Musket Shot. It is to illustrate the Question, whether in such Cases, the Excision of the Bone, or Amputation at the Socket, should be performed.

PLATE VII.

This Sketch illustrates the Second Part of the Paper on Amputation at the Shoulder Joint; it is one of four Cases taken after the Battle of Waterloo, in which the Arm was carried off by a Cannon Shot; where in each the Treatment was different, and in all successful.

He belonged to the German Legion; a round Shot carried off his Arm on the Field of Waterloo; in this Condition, unsubdued, he rode upright into Brussels, fifteen Miles, and presented himself to Dr. Bach at the Hospital of St. Elizabeth. When put into Bed he fainted, and remained insensible for Half an Hour.

PLATE VIII.

Fig. 1. Represents a Joint formed after Fracture of the Thigh.—See the Case of Soane, and Observations on false Joints.

A. The superior End of the fractured Bone.
B. The Extremity of the inferior Portion.
C. A new Capsule formed.
D. A Ligament, having a near Resemblance to the internal Ligaments of Joints.

Fig. 2. A Fracture of the Femur, followed by soft Cancer.

A. The superior Portion.
D. The inferior Portion of the Bone.
C. C. The new Ossification extremely irregular.
B. B. A soft Cartilaginous-like Matter, occupying the Cancelli of the Bone.—See the Cases of soft Cancer in the succeeding Number.



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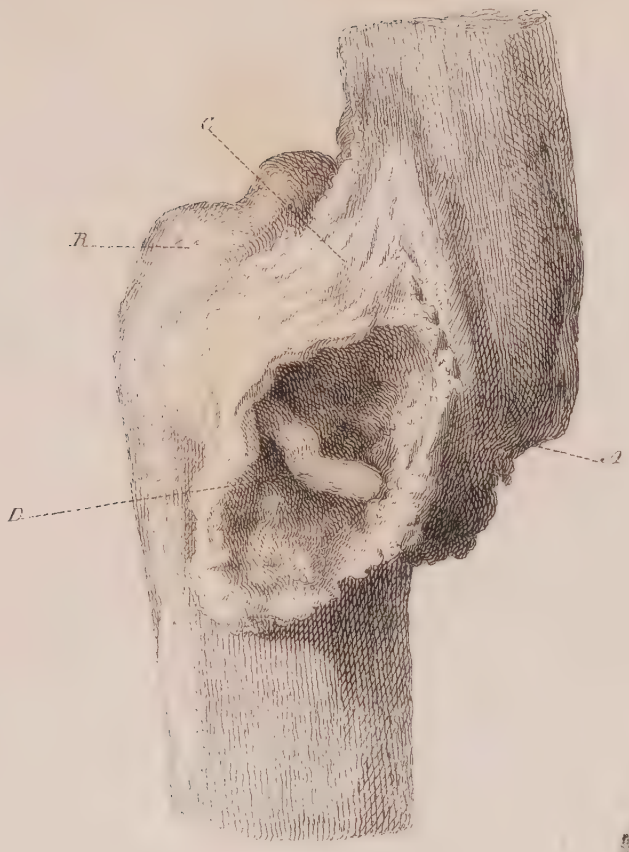
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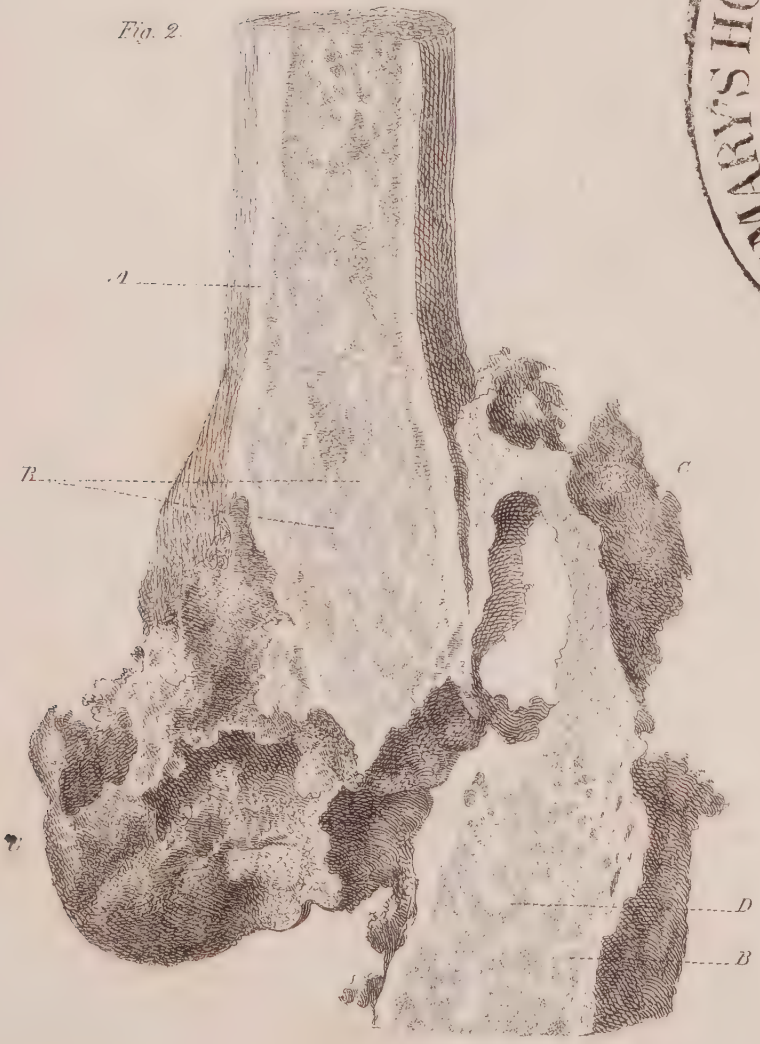
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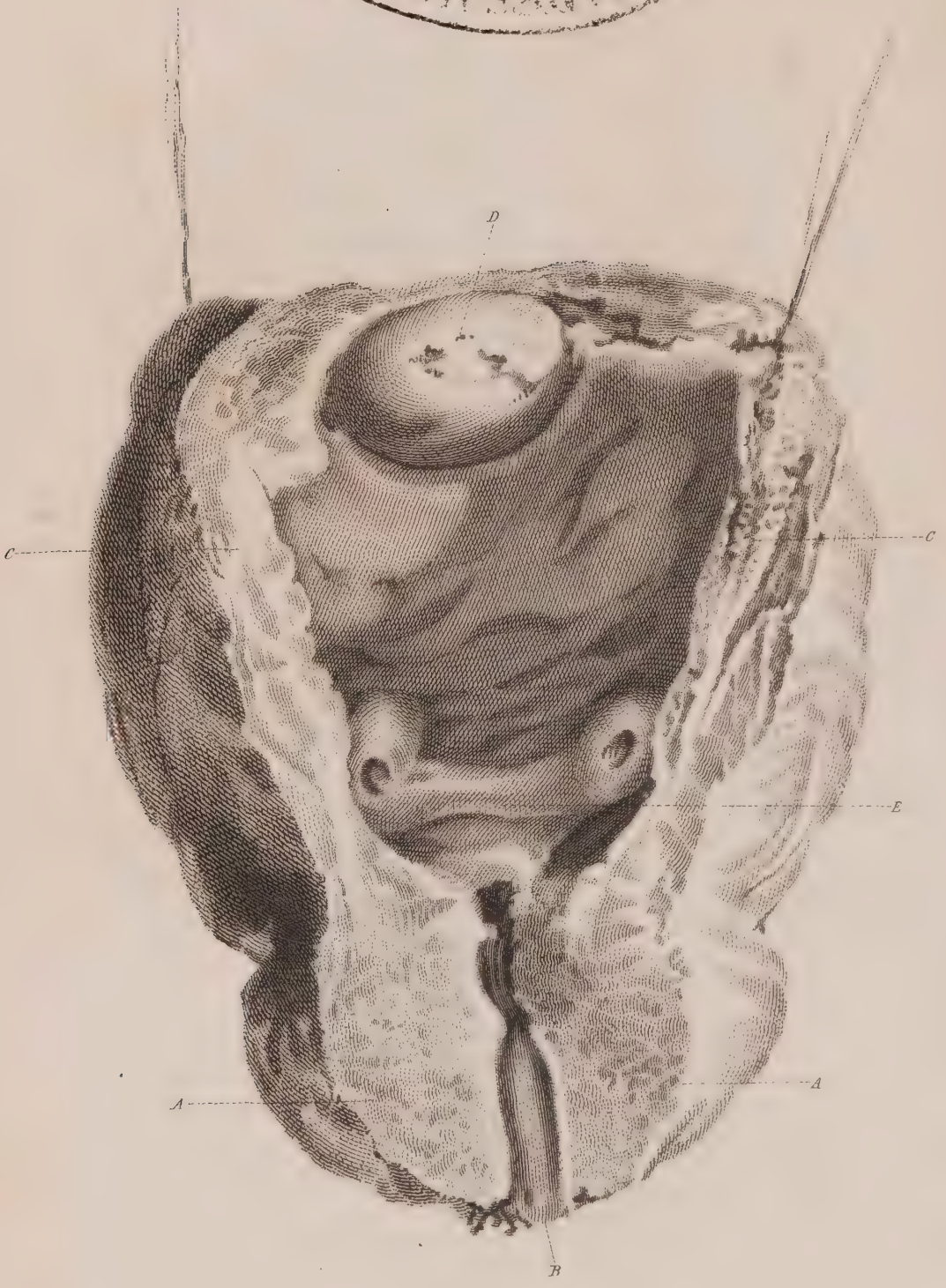
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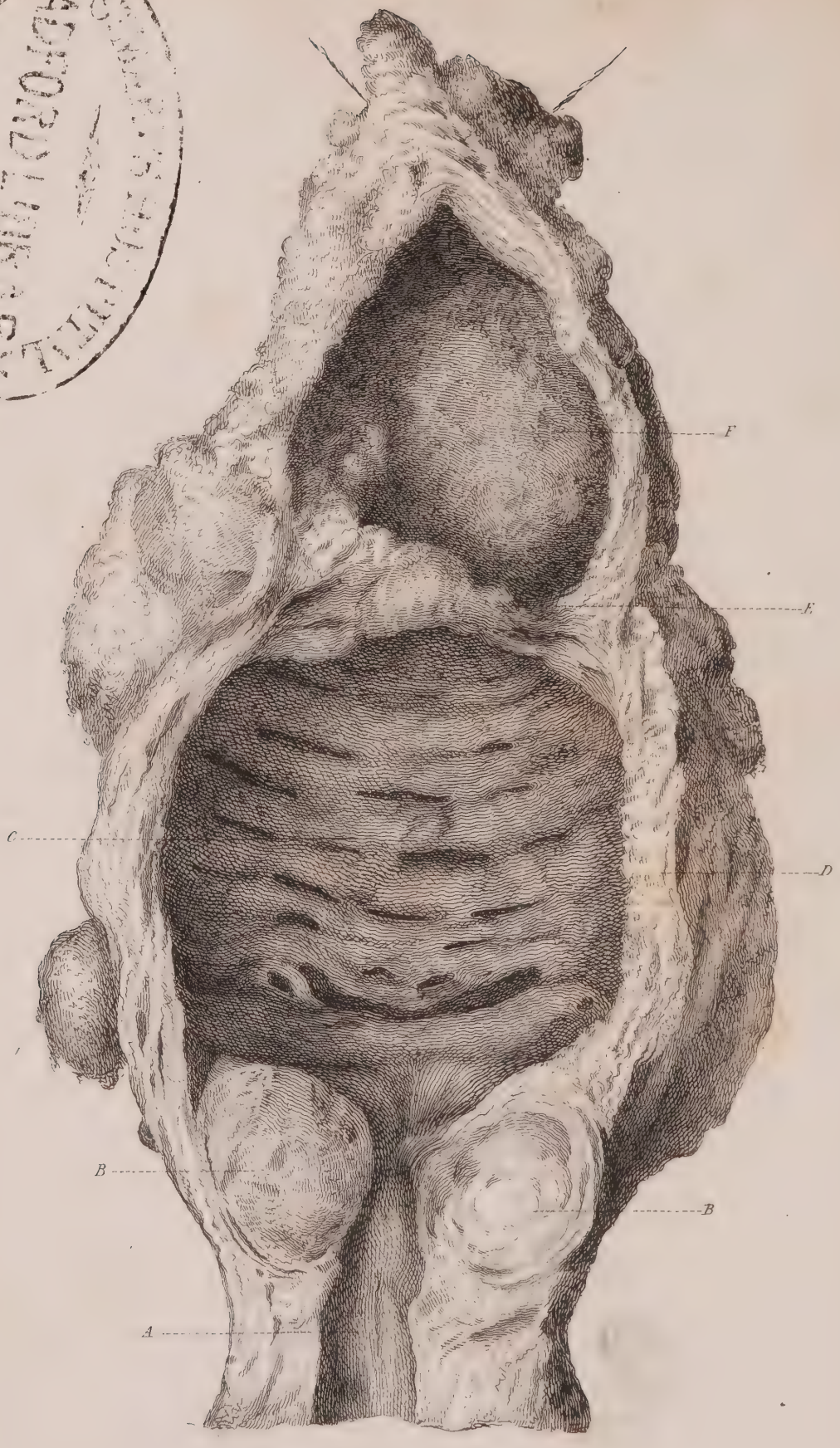
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EXPLANATION

OF THE

PLATES.

PLATE XI.

The urinary bladder, having a stone sacculated betwixt its coats.

A A. The prostate gland divided.

B. The urethra.

C C. The coats of the bladder considerably thickened.

D. A calculus seated within a sac, and half concealed.

PLATE XII.

The urinary bladder, having a sacculus, containing a stone, and a great many stones adhering to its inner surface.

A. The prostate gland.

B B. The inner surface of the bladder; the bladder being cut open, and presented in a lateral view.

C. Two large stones attached to the inner surface of the bladder, one of which blocks up the ureter.

D D. Many small calculi, attached to the inner surface of the bladder.

E. A hole leading from the cavity of the bladder into a sac.

F. The sac, containing a large calculus.

PLATE XIII.

The urinary bladder, having a large sac attached to it, which contained a stone.

A. The urethra.

B B. The prostate gland cut across.

C. The cavity of the bladder.

D. The coats of the bladder thickened.

E. The communication betwixt the bladder and the sac.

F. The sac, from which a large stone was taken.

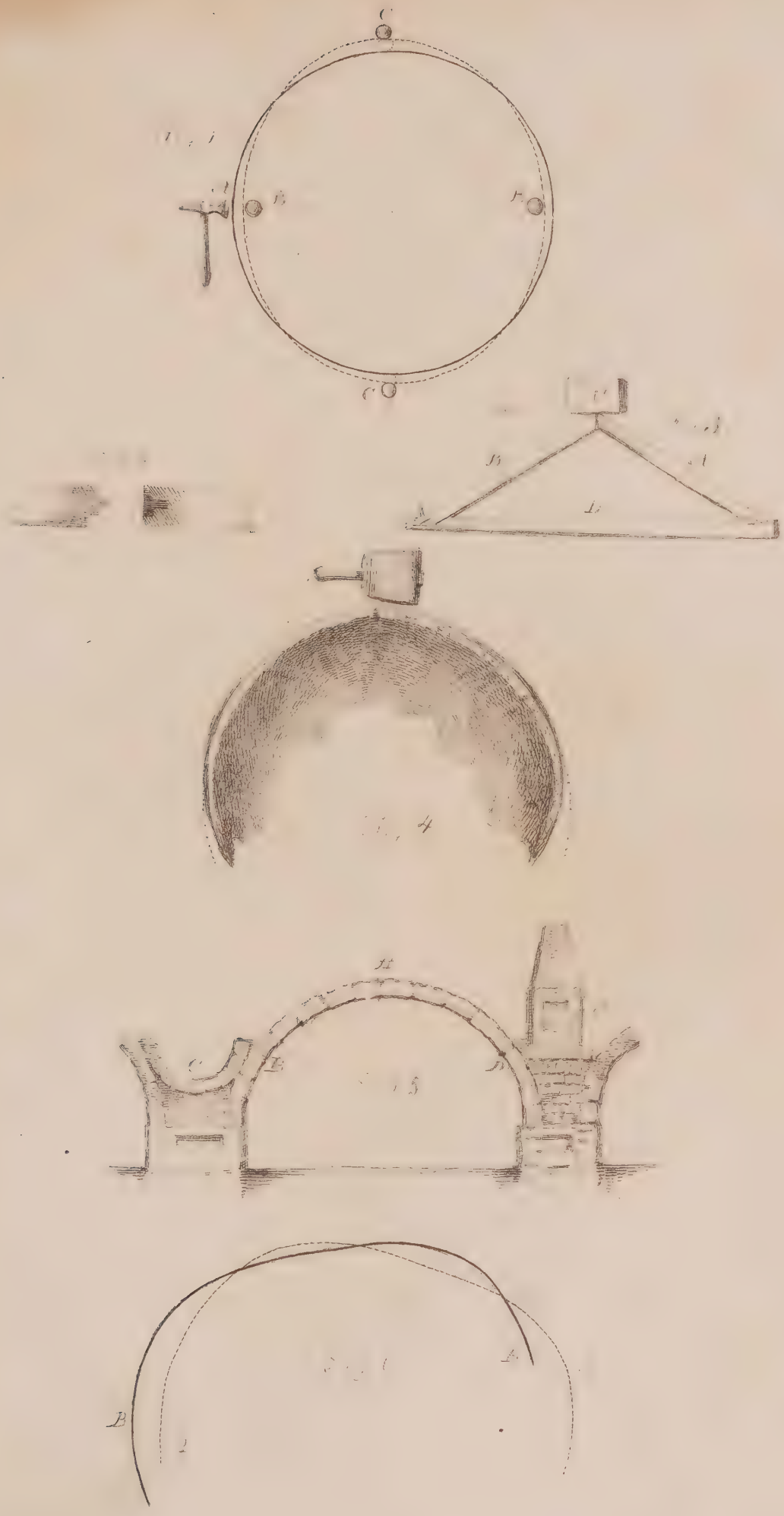
PLATE XIV.

These outlines are in illustration of the paper on the form of the skull, and on the counterfissure.

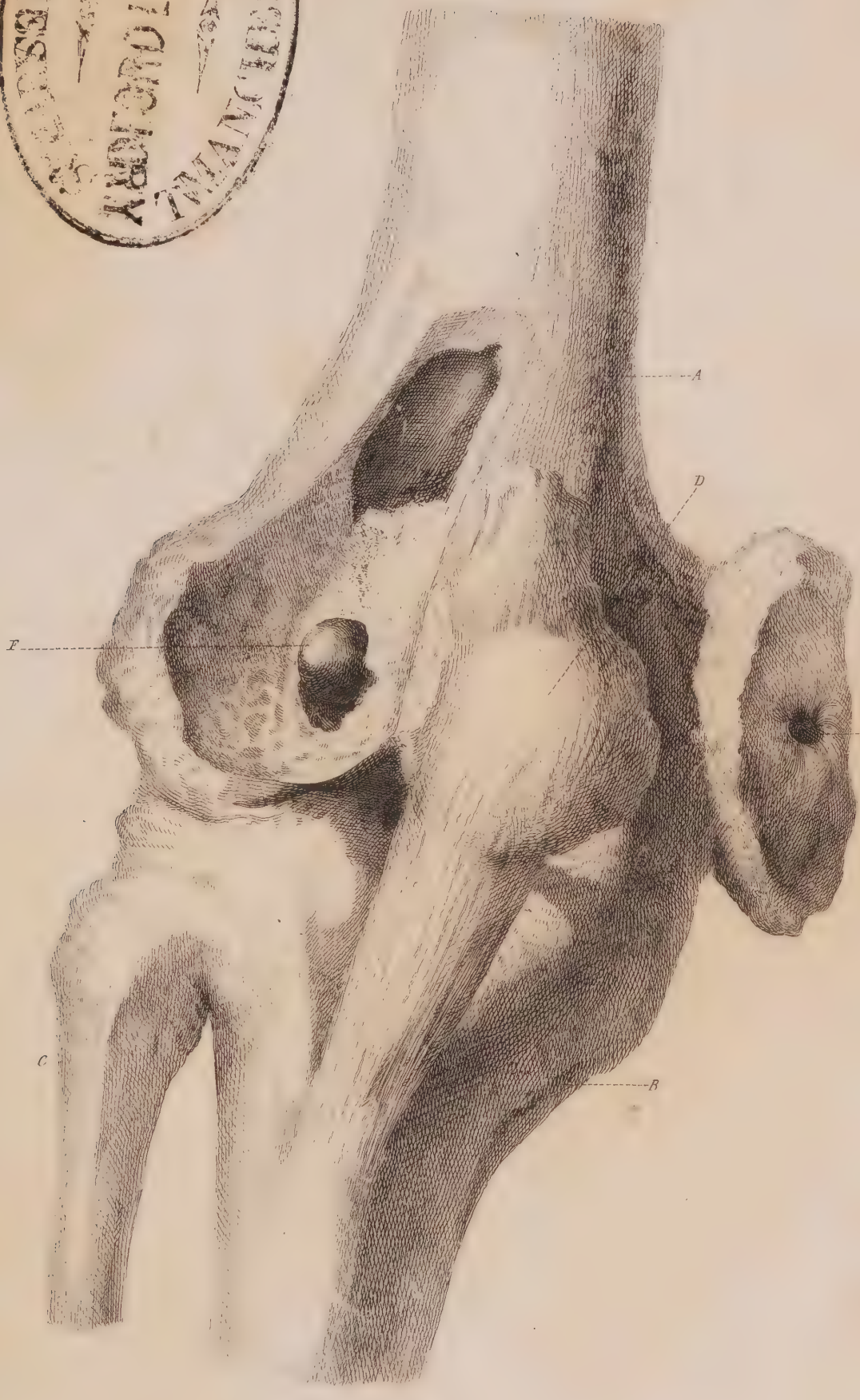
PLATE XV.

This Plate represents the knee-joint wounded by gun-shot. The musket ball is lodged in the centre of the left condyle of the femur. The femur and tibia are ancylosed, and the patella is also united to the femur by ossification.

A. The femur.
B. The tibia.
C. The fibula.
D. The patella.
E. Part of the integuments left attached to the bone and the hole of the original wound.
F. The ball seated in the cancelli of the head of the femur.



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